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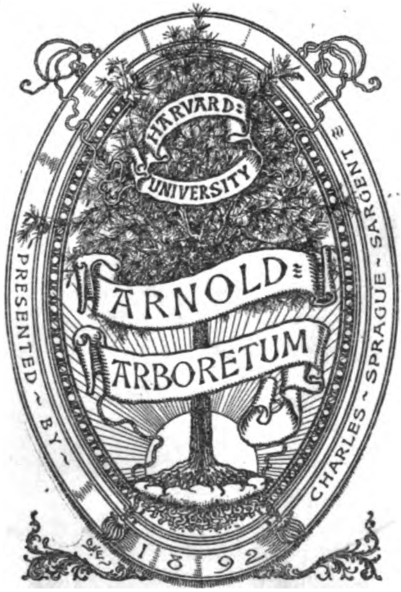

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VOL. 1. NO. 1.

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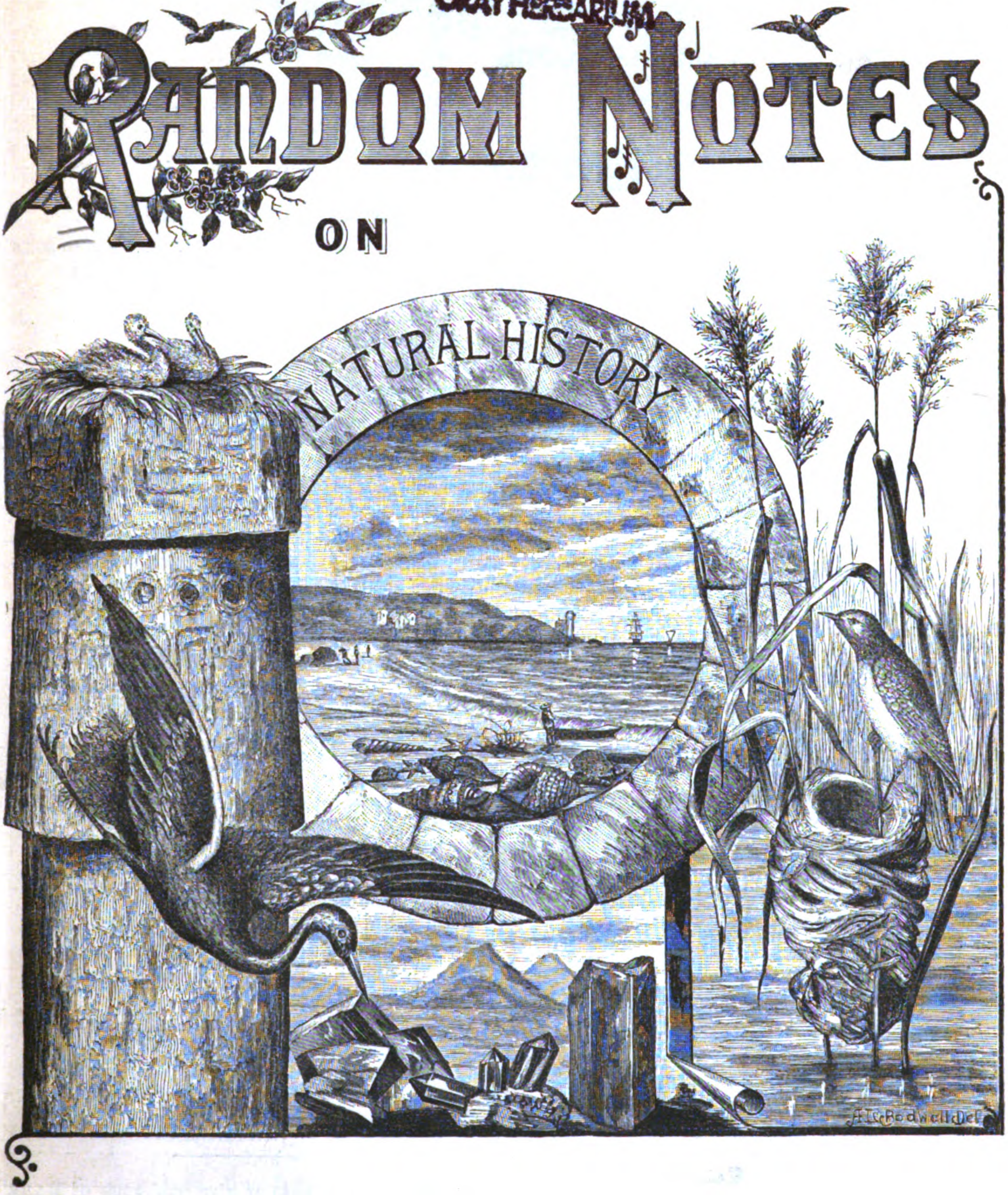
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Random Notes on Natural History.

Vol. 1. PROVIDENCE, JANUARY 1, 1884. No. 1.

Random Notes on Natural History.

A PAMPHLET DEVOTED TO THE DISTRIBUTION OF USEFUL KNOWLEDGE CONCERNING THE VARIOUS DEPARTMENTS OF ZOOLOGY, MINERALOGY, AND BOTANY. 50 CENTS A YEAR.

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IT is proposed in these pages to note the occurrence in Rhode Island of unusual species, or those otherwise of interest, beside such general news as shall be profitable to the student and collector, to report the progress of various scientific societies in this state, and at each issue to devote a portion to publishing a checking-list of shells.

TAXIDERMY.

COLOR OF BIRDS' EYES.

BOOKS on ornithology are not explicit enough in this particular. While in a few cases errors are quoted from one book to another without any one taking the pains to correct them. A very prominent case of this sort, is that of the Long-tailed Duck, *harelda glacialis*, generally given as white, though it is light brown, as we have proved by many specimens. An exceptional case may be white, for many species show different colors in different individuals. The adult and young birds are also frequently different.

Bald Eagle, adult; usually nearly white or cream.

Bald Eagle, young, dark brown, called "hazel."

Bald Eagle, adult (one specimen), clear *vermillion.*

Osprey, adult, straw.

Osprey, young, reddish brown, hazel.

Golden-winged Woodpecker, dark red, hazel.

Downy Woodpecker, dark red, hazel.

American Sheldrake, usually red. Two fresh ones recently received, had hazel.

American Swan, hazel.

Mallard, hazel.

Gannet, adult, cream.

We have already made numerous notes upon the color of the iris, and have received many more from correspondents. We shall, however, be grateful for further assistance, which, if not new, will serve to confirm observations already in hand, and which may be looked for in succeeding numbers.

HOW TO SOFTEN AN OWL'S FEET.— First with a sponge sop the feathers on the feet and legs until soaked through, and then put to soak in a dish of scalding water for a few moments.

HORNBLENDE.

PARTICULARLY beautiful specimens of this species, are found at Calumet Hill, Cumberland, R. I., penetrating sometimes the opaque, but oftener limpid quartz, in long black crystals from the size of hair to those measuring a sixteenth of an inch in diameter, interlacing and crossing the matrix in all directions. The accompanying rock is a syenyte, which has been wrought for monumental purposes. The veins of this desirable material are exposed occasionally, as the work of quarrying proceeds. The workmen soon learn its value and monopolize the best at once. Work in the quarry is for the present abandoned, and this, almost the only avenue for obtaining specimens, is closed, while such material as was on hand has been absorbed by a few persons; one large lot has been sent to Europe and cut for jewelry. Clear and well-formed crystals of quartz, from three-quarters to two inches long, are occasionally found, and they also are penetrated by the hornblende.

The occurrence of ascicular crystals of hornblende penetrating quartz is very uncommon, this being the only reported locality in America.

We have never seen finer specimens from any other place, and correspondence with several gentlemen well posted on minerals establishes their occurrence at Minas Geraes, Brazil, possibly at St. Gothard, and in China, from whence they come cut usually into curious bottles and ornaments.

THE PROVIDENCE FRANKLIN SOCIETY

is the oldest society in the state devoted to general scientific research, holding its meetings every alternate Tuesday.

President — LEVI W. RUSSELL.
Vice-President — DAVID HOYT.
Secretary — CHARLES M. SALISBURY, ESQ.
Treasurer — A. L. CALDER.

A course of lectures in botany, by Prof. W. W. Bailey, is now in progress, and others upon kindred topics are proposed. The committee of the Geological department is trying to bring together all published facts regarding the geology of the state, and so far as their limited opportunities permit, to accumulate new material and make a more extended survey.

THE NEWPORT NATURAL HISTORY SOCIETY

was incorporated June 1st, 1883, numbering among its members many of Newport's most distinguished citizens, as well as several of the prominent summer residents.

President — PROF. RAPHAEL PUMPELLY.
Corresponding Secretary — GEORGE C. MASON.
Treasurer — DR. WILLIAM C. RIVERS, JR.
Curator — J. J. MASON.

During the past two months there have been three very interesting lectures: Prof. Dale, on the "Paradise Rocks"; Prof. Pumpelly, on "A Journey through the Rocky Mountains," and Mr. Richard Bliss, on "Some Curious Forms of Fishes." The society proposes to do active work. A good general collection and an aquarium are looked forward to with confidence.

THE RHODE ISLAND ENTOMOLOGICAL SOCIETY.

THIS society was organized June 6th, 1883.

President — EDWIN E. CALDER.
Vice-President — H. TERRY, M. D.
Secretary and Treasurer — F. E. GRAY.

Meetings are held fortnightly; thirty-three active members are now enrolled. At the meeting Dec. 12th, Mr. G. M. Gray read a paper upon the wings of insects, and specimens of the moth, *Ecpanthia Scribonia*, beetles, *Dynastes tityus*, and a larva of *Dynastes Hercules* were exhibited and discussed. Dec. 26th, Edwin E. Calder read a paper upon the mouth parts of some coleopterous insects.

SEA-URCHINS.

FEW marine animals are more readily recognized than the sea-urchin. There is scarcely a rocky point along our entire coast where colonies of them cannot be found.

Slowly crawling over the surface of rocks just below low-water mark, or in pools left by the receding tide, to the casual observer they appear like so many chestnut burs, but on endeavoring to take them up one soon sees his mistake. Even on a smooth rock the sea-urchin, by means of its ambulacral suckers, has a most tenacious hold, and even when placed on its back, it will, by drawing with these suckers and skillfully propping with its spines, soon right itself.

Not satisfied with the protection necessarily rendered by its dull green or purple color, it collects bits of sea-weed and shells, with which it often so skillfully covers itself as to be indistinguishable from the groups of algæ always found in its immediate neighborhood.

Physiologically it is a most interesting animal. The simple alimentary canal; highly differentiated mouth parts, of which the dentary apparatus forms the so-called Aristotle's lantern; the water vascular system, and a most generalized nervous system, consisting of little more than a ring of nerve fibre surrounding the mouth and sending radiating nerves to the several divisions of the body, render the sea-urchin a most excellent subject for dissection, and as such it holds an important position in the majority of elementary text-books on general anatomy.

The dried specimens, as objects for comparison with allied forms, such as the stars, crinoids, ophiurans and holothurians, are extremely interesting and useful, both when entire or when denuded of the spines. Naturally-prepared specimens of the latter kind are often found along sandy beaches where they have been rolled, from their original positions among the rocks, by the waves. In this state they are clean and white, and are at once recognized as the fisherman's sea-eggs.

* *

CURIOUS DEATH OF A SAW WHET OWL.— A boy in Kingston, R. I., found one in a partridge snare.

An Introduction to a Series of Papers on the Shell-Bearing Mollusca of Rhode Island.

[BY HORACE F. CARPENTER.]

THE study of shells, aside from the technicalities of scientific description, is beautiful and interesting. The gaily colored and fantastic marked shells of the tropics, had been gathered and preserved by sailors and travelers, for their beauty or their rarity, long before the anatomist had observed and described the animals contained in them, or before conchology had taken its place among the natural sciences.

There are many people who say, What is the use of these things? they are of no benefit to man unless they have a commercial value. For the benefit of such persons who can see no beauty or pleasure in anything which does not represent money, I would say, that every shell, however humble in appearance, or however common in certain localities, has its market value, established by dealers in such things in all the large cities of the world, whose business consists in buying and selling objects like those I am about to describe. Rare species have great value in the eyes of such dealers. Two hundred and fifty dollars have been paid for a single specimen of Conus gloria-maris, and one hundred and fifty for a specimen of Cypræa umbilicata; while in Western Africa, the Cypræa moneta is used for money itself, many tons of this shell being annually collected in the Pacific, and carried to Liverpool to be again exported for barter with the native tribes of Africa.

That trading in these insignicfiant objects is remunerative, may be shown from the fact, that one of the largest dealers in London told me that his annual net profit from the sale of shells, fossils, etc., amounted to £1500 to £2000 sterling. A detailed account of the uses to which shells are put would fill a volume; suffice it to say, that in the preparation of hundreds of articles of necessity and of luxury, and in the mechanical arts, shells play a prominent part.

The animals which inhabit the shells of the various classes of the type Mollusca, differ from each other in their appearance and in their habits, as much perhaps, as do the higher animals. A large proportion of the marine Mollusca are carnivorous, feeding upon each other, as well as upon other species, which are vegetable eaters, and in their turn furnish food for millions of other creatures. Animals of every rank in the scale of being, and of every type, class and order, feed more or less upon the Mollusca. Man also, in common with the higher animals, subsists to a great extent upon them.

Snails are considered a great delicacy in France, Spain, and Switzerland, and in Italy, where they are fattened for the market in pens or sties. In Paris they are to be found in the restaurants, cooked and stuffed with some green herb, and are also sold in the streets, alive.

In England, a small marine snail, Littorina littorea, is sold by old women at the street corners, to people, who after picking out the boiled animal with a pin, throw the shell in the gutters. Buccinum undatum, Cardium edule, and Mytillus edulis form a large part of the food of the poorer classes in Great Britain. Pholas costata may be seen daily in the markets of Havana, and the Haliotis, or pearly ear shell, is collected by thousands on the coasts of California by the Chinese, who eat the animal and send the shells to China, there to be manufactured into various articles of virtu.

In our own state, who can say how many oysters, clams, quahaugs, scallops and mussels are annually devoured by our citizens. Those who advocate a fish diet on account of the phosphorous, or brain food contained in it, might with equal propriety include the Mollusca, as they also contain a large proportion of phosphorus.

The science of Conchology is one in which *ladies* may engage, with much profit and pleasure to themselves and to others. There are many ladies in different parts of Europe who have accumulated quite extensive collections of shells, and who have added largely to our stock of knowledge by their personal researches. In America, among many who have studied and collected our shells, may be mentioned Miss Annie E. Law, of Concord, East Tennessee, who has personally explored the Holston River for a distance of twenty miles, and has published in the *American Journal of Conchology* for 1870, a list of the fluviatile shells found by her in that river, numbering ninety-five species; also a synopsis of the land shells of East Tennessee, collected by her and numbering thirty-three species. In Bermuda, Miss Annie M. Peniston is collecting in quantities, the shells of those islands, of which there are many varieties, with a view to exchanging Bermuda shells for those of other parts of the world.

The largest collection of shells in the world is in the British Museum in London; its immense collection, which has been accumulating for years, having recently received the addition of the cabinet of the late Hugh Cumming, a gentleman who spent thirty years of his life traveling in all parts of the world, constantly collecting, buying, and exchanging duplicates with others, until he had accumulated nearly thirty thousand species. The largest collection in this country is in the Academy of Natural Sciences, at Philadelphia. Besides the public collections contained in the various museums throughout the country, such as the museum at Central Park, N. Y., the Boston Society of Natural History, the Essex Institute at Salem, Brown University in Providence, and many others, there are a great many private cabinets, one of which, belonging to a gentleman in New York City, contains twelve thousand species; another in Oakland, California, contains ten thousand species. A great deal of interest is taken in Conchology in New Bedford, Mass., there being nearly fifty private cabinets in that city containing one thousand species and upwards in each.

The Mollusca are distributed over the surface of the earth, in geographical and in zoological provinces, or centres of distribution. No one section of country or continent, even, can furnish species of all the genera, families, orders or classes, of any branch of natural history. The *world* is the field; and only by comparison and research in all parts of our globe, can we obtain the material for a monograph of any group.

The fauna of Rhode Island is of course very limited, and there are many families, orders, and even whole classes, not represented at all. Out of more than thirty thousand species of shells, known and described by naturalists, there are but a little over two hundred existing in our state. The marine species may be represented as largely in numbers perhaps, as in any other portion of our cold northern shores, but the land and fresh water species are not only numerically small, but are also stunted in size; specimens of the same species found in Rhode Island being much smaller than those found farther west. The reason for this is, that our soil is destitute of lime, while the western states are rich in it; and as the animal secretes its shell (which is composed of carbonate of lime) from the food it lives upon, the reason is obvious.

[*To be continued.*]

A Very Rare Bird in Rhode Island.

A YOUNG Gyrfalcon, *Hierofalco gyrfalco var. sacer*, was killed by E. S. Hopkins, Esq., at Point Judith, Oct. 11, 1883, and brought to us. For the benefit of those who may be unacquainted with this bird in the young phase of plumage, we would state: It most nearly resembles the adult Goshawk in general coloration, but the breast is streaked up and down as in the young Goshawk, and not crosswise as in the adult bird. This is the second record for Rhode Island, the first being by Mr. Dexter, winter of 1864–65.

The specimen in the collection of Brown University has quite a story connected with it. It was sent alive from Maine to a gentleman here, and he, not knowing what to do with it, came to us, representing it to be, as he supposed, a Goshawk. As we could not use it at the price it had cost him, he signified his intention of giving it to Roger Williams Park, where we assured him it would be acceptable. We visited the park shortly afterward, and saw the bird for the first time, which was not a Goshawk, but a Jerfalcon. We told Mr. Adcock about it, and upon visiting the park he learned of its death, and the wings were pointed out to him tacked up in the barn. These he obtained, as also the body, which had been buried about a week, and with careful work succeeded in making a good specimen of it.

BRUNNICH'S GUILLEMOT IN RHODE ISLAND. — Mr. H. A. Talbot shot one between Warwick Neck Light and Patience Island, Dec. 26, 1883. The first specimen we have ever known taken in Narragansett Bay.

Since the above article was set up, another specimen has been received from Bristol.

BOOKS on Natural History for sale by Southwick & Jencks, Providence, R. I.

FROM THE EGG TO THE TOAD.

THERE are some facts connected with the natural history of the toad which may not be familiar to some of our younger readers. The female toad, when the period of incubation approaches completion, seeks water, where she deposits her spawn in shallow places, winding the spiral beads of eggs around the grass, where it is left to hatch. In a few days — the time depending on the temperature of the water — the eggs hatch, not a toad, but a tadpole, breathing like a fish through gills, and living entirely in water as fish do.

This tadpole grows very rapidly, and in ten or twelve days the transformation to the toad commences by the appearance of the two hind-legs; next come the fore-legs, and the little fellow presents the curious appearance of a toad with a tail. The horny beak with which the tadpole's mouth is armed now drops off and the toad's mouth takes its place. Gradually the tail is absorbed and a diminutive toad leaves the water, breathes like an animal through nostrils instead of gills, and now may be drowned in water while the tadpole would have been drowned in air. The little toad now starts out to make his living by catching the insects.— *J. S. N., in Southern World.*

QUERCUS MAGNIFICA.

THIS surviving monarch of the "forest primeval," found at Munroe's Four Corners, in South Seekonk, about five miles from Market Square, on the Providence and Fall River road, measures ten feet in diameter at the ground, and for thirty feet in height the diameter of the trunk is about five feet. Its arms, too, are giants and spread to a prodigious length. On roots, trunk and limbs, the knots and gnarls are many and massive. The age of this kingly white oak, probably the largest now to be found on the Atlantic coast, has been a deep question. Its best traditions may be found in the Munroe family and with Mr. Matthew W. Armington, the oracle of East Providence history. With reason it is thought that it can count from six to eight hundred years, the probabilities being with the larger number. It is known that about two hundred years ago it was as large as it is at present, for during that time the gales have robbed it of some Herculean limbs. It is told that Revolutionary soldiers, marching through the country, here halted and boiled their beef and pork under its branches. On one of its large arms for a time swung the sign of the old and famed Munroe Tavern. For several generations, as men count them, the huge trunk has been somewhat hollow, and has been inhabited by squirrels and swarms of honey-bees. Boys have exterminated the squirrels, but the bees still hold the fort. Multitudes of travelers and festive parties have stopped to rest and share their lunches beneath the royal branches. This is the historic tree mentioned in Bliss' History of Rehoboth. It is commended to photographers. It ought to be protected by an iron fence.

To stand under this tree, with Mr. Armington as its interpreter, is to be filled with a sentiment of veneration and be carried back through all the history of New England and into the dim centuries of Indian life. It is easy to imagine that here paused Massasoit, Roger Williams, and King Philip. It is not hard to believe that the ancestors of Massasoit might have held war councils in its shade, for its grandeur naturally invited grave assemblies. Now if the famed merchants, Brown & Ives, deemed it suitable and wise to protect the life of the grand old oak at Lonsdale, how strong is the claim for this nobler patriarch of the forest to be sacredly preserved. Woe to the hand that shall rudely strike it. Even the birds of centuries have sanctified it with their songs.

F. D.

MR. J. B. Smith prepares his duplicate Coleoptera in the following manner: They are soaked for a week or more in a fluid composed of 100 grammes of alum, 25 of salt, 12 of saltpetre, 60 of potash, and 10 of white arsenic dissolved in 3000 grammes of boiling water. The solution is filtered, and when cold add to every ten parts four of glycerine and one of methyl alcohol. Insects prepared in this manner remain soft and flexible, and can be sent in boxes without being pinned and without danger of breaking.— *Science Record.*

RIDGWAY'S NOMENCLATURE OF NORTH AMERICAN BIRDS. Government edition. Price 35 cents, post-paid.

Southwick & Jencks' BIRD CATALOGUE, for *20c.*, contains the above.

We think no periodical devotes any regular space to taxidermy, and in many particulars no work on the subject is explicit enough. For the benefit of our readers and the furtherance of the art, we shall be pleased to use our columns in answering queries on this subject.

Our correspondence is large, and hardly a day passes, without queries of "what will you give for this or that?"

Parties writing us to sell goods, are respectfully requested to send a list of them with prices, and to enclose a stamp, which will insure the more prompt attention.

It will also be a great assistance if those desiring to collect for us would carefully state what articles in particular they expect to obtain. We often receive propositions, of which the following is a fair example, and to which a definite reply is quite impossible:

"I am going to Florida for some months. Please write me a full list of what you want from there and what you will pay, and if it is any object to me I would like to collect for you."

Catalogues Issued by Southwick & Jencks' Natural History Store.

Our Catalogue of March, 1883, is as applicable to our general stock now as when issued. We shall use space in RANDOM NOTES to advertise additions, and also offer special inducements on stock of which we may have an excessive quantity, or on which we get bargains ourselves. But such special prices will be only for limited time, at the expiration of which the regular catalogue rates will be asked.

Send for Catalogues as follows:

Birds. — Contains Ridgway's Check-list, entitled *Nomenclature of North American Birds*. It is printed entire, with both scientific and common names, and old and new numbers. It gives instructions for skinning birds and blowing eggs; also, price-lists of foreign bird-skins, insects, and all naturalists' supplies. Price, 20 cents.

With the *Nomenclature* printed only on one side, for labeling, 25 cents.

Minerals.— Gives Dana's species number, localities, and valuations — 6 cents.

Shells. — Contains a very full list of prominent species and gives authorities and many synonyms; also, habitat and valuations — 10 cents.

The three catalogues for 25 cents.

Every person buying to the amount of $1.00 or more is entitled to one copy free, and may deduct the amount paid for same from the first order amounting to $1.00.

Short-Eared Owl's Nest.

While hunting for ducks' nests in a patch of old prairie grass, I chanced to look around, and espied a Short-eared Owl flying in the opposite direction from that we chanced to be moving, and which my companion had evidently started. When at a safe distance it turned face toward us, and began ascending, until it looked no larger than a sparrow. Feeling sure it must have a nest we searched diligently, but without success, and when we left the owl was still watching us from its secure height. About three hours later I returned to make one more effort, and flush the bird if possible. On nearing the spot a flock of Black Terns came within range, and thinking the report of my gun might benefit my cause, I killed one, and the owl arose from close by where the tern fell. The nest was in the hollow left by treading down the grass in every direction, radiating from the centre, and was over two feet across. It was, moreover, on one of the most prominent hillocks.

The incubation was too far advanced to please an oölogist, as the seven eggs were just hatching, with the exception of two that were rotten.

In the proceedings of the Zoological-Botanical Union of Vienna, for 1882, Mr. A. F. Rogenhofer figures a specimen of moth (*Zygæna minos*) with five wings. The additional wing is between the two normal wings of the left side. It resembles the hind wing in shape, but the distribution of the nerves is peculiar. Such deformities are very rare.— *Science Record*.

Cement for Stone or Marble. — The best cement for mending marble or any kind of stone, is made by mixing 20 parts of litharge and 1 part of freshly burned lime in fine dry powder. This is made into a putty by linseed oil. It sets in a few hours, having the appearance of light stone.

Taming Wild Humming-Birds.

A LADY residing at San Rafael, one of the many pleasant health resorts of California, has sent to friends in London an account of the taming of two free wild humming-birds by her daughter, who, under medical direction, has for some months passed several hours daily reclining on rugs spread on the garden lawn. "E. has a new source of interest," her mother writes. "The humming-birds have claimed her companionship and manifested their curiosity by inspecting her, with their little wise heads turned to one side, at a safe distance, watching her movements, evidently wishing to become acquainted. To entice them to a nearer approach, E. plucked a fuchsia, attached it to a branch of a tree over her head, and filled it with sweetened water. The intelligent little creatures soon had their slender bills thrust into the flower, from which they took long draughts. Then E. took honey, thinking they might prefer it, and filled a fresh flower each day. They would sometimes become so impatient as scarcely to wait for her to leave before they were into the sweets, and, finally, while she held a flower in one hand and filled it with drops from a spoon, the now little tame pets would catch the drops as they fell, and dart into the honey cup their silvery, threadlike tongues. E. is delighted, and so fascinated with them that she passes hours each day of her resting time talking to them and watching their quick, lively movements. Although these tiny birds are humming all day among the flowers, two only have monopolized the honey-filled flower, and these are both males, consequently there are constant squabbles as to which shall take possession. They will not permit a wasp or a bee to come near their honey flower, and not only drive them away, but chase them some distance, uttering a shrill note of protest against all intruders." Referring to them again, at the close of the rainless Californian summer, in a letter dated October 26, this lady writes: "We have had threatening clouds for two days and a heavy rainfall today. E. has continued her devotion to her little humming-birds. Since the change of weather she has tried to coax them to the parlor windows. They appeared to think there must be some mistake, and would hum about the window where she stood with the honey flower and spoonful of honey, or they would sit on a branch and watch every movement, yet not daring to take a sip until to-day, when at her peculiar call, which they always recognize, one ventured repeatedly to take the honey from her hand.—*Scientific American.*

A CLEVER process has been discovered by which snails, frogs and other reptiles can be preserved and retain the color of the flesh. The animal being cleansed, is soaked in chromic acid until hardened; then being thoroughly washed in water, it is subjected to a bath of absolute alcohol, until the water which has more or less saturated the skin leaves no trace of its presence. The third operation consists in putting the specimen in turpentine three or four days, when it will be found ready for the fourth and last process, which is to paint the entire body with a solution of sugar and glycerine. We have kept small insects in glycerine, and it is wonderful how they will remain unchanged if a rubber cloth be placed alone over the mouth of the bottle.—*American Angler.*

"PAPA," said Rollo, looking up from *Roughing It*, "what is gold-bearing quartz?" "Well, my son," replied Rollo's father, who was glancing in a troubled manner at the milkman's bill for October, "when a man sells diluted water for nine cents a quart, I think he has struck better gold-bearing quarts than ever Mr. Mark Twain dreamed of."—*Burlington Hawkeye.*

AN ornithologist has discovered that to have an appetite proportional to that of a robin, a man would have to devour daily a string of sausages sixty-seven feet long and nine inches in diameter. Make a "bob 'o link" of himself, in fact.—*Boston Courier.*

NIGHT HERON IN WINTER.—A young Night Heron was killed in Bristol, R. I., Jan. 5th. For several days previous to this date the weather had been below the freezing point. How did he get a living?

OWLS last winter were abundant, but the change of a year is a radical one, for while several kinds were unusually plenty then, all kinds are now scarce.

CONCHOLOGICAL CHECK-LIST. I.

J. RITCHIE, JR.

Having prepared for my own use some lists of the families *cyclostomacea* and *helicinacea*, it has occurred to me that these lists might be of service to other collectors. I have therefore extended the original scheme somewhat, and have included all the genera in the sub-order *pneumonopoma* Pfr. The system followed is that which is used in Paetel's excellent catalogue, and the species not listed by him have been supplied from such other lists, printed and manuscript, as have been found in our libraries in Boston. These lists cannot claim to be either complete or faultless, but they do include many species which probably have not before been brought together.

Class. Gasteropoda Cuv.
Sub-class. Pulmonata Cuv.
Order. Pneumonopoma Pfr.
Sub-order. Opisophthalma Pfr.
Family. Aciculacea Pfr.

Acicula fusca Walk.
lineata Drap.
polita Pfr.
producta Lowe.
simonaria Charp.
spectabilis Rouss.
striata Q. and G.
Acmella hyalina Theob. & Stol.
moreletiana Stol?
roepstorffiana Stol?
tersa Bens.
Paladitha macleyana Bourg.
Moetessieria rollandi Bourg.
Geomelania affinis C. B. Adams.
angustata Gund.
beardsleana C. B. Adams.
conica C. B. Adams.
costulata C. B. Adams.
elegans C. B. Adams.
exilis C. B. Adams.
expansa C. B. Adams.
fortis C. B. Adams.
gracilis C. B. Adams.
greyana C. B. Adams.
hilliana C. B. Adams.
jamaicensis Pfr.
magna C. B. Adams.
media C. B. Adams.
minor C. B. Adams.
pauperata C. B. Adams.
procera C. B. Adams.
pygmæa C. B. Adams.
pyramidata C. B. Adams.
striosa C. B. Adams.
typica C. B. Adams.
vicina C. B. Adams.
Chittia sinuosa Chitty.
Truncatella adamsi Pfr.
aurantia Gld.
arctecostata Mouss.
bairdiana C. B. Adams.
bilabiata Pfr.
californica Pfr.
Truncatella capillacea Gund.
caribæensis Sow.
ceylanica Pfr.
clathrus Lowe.
concinna Pease.
conspicua Bronn.
crassicostata Sow.
cylindracea Pease.
filicosta Gund.
funicula Mouss.
futunaensis Mouss.
gouldi C. B. Adams.
granum Garrett.
guerini Villa.
laminata Cpr.
littorina Phil.
marginata Küster.
montagui Lowe.
pacifica Pease.
pallida Pfr.
pellucida Dohrn.
porrecta Gld.
princeps Dohrn.
pulchella Pfr.
quoyi Pfr.
rostrata Gld.
rustica Mouss.
semicostulata Jick.
scalariformis Reeve.
scalarina Krefft.
scalaris Mich.
semicostata Montrz.
stimpsoni Stearns.
striata Sow.
subcylindrica Gray.
teres Pfr.
truncatula Drap.
turricula Mouss.
valida Pfr.
vitiana Gould.
Tomichia melanoides Benson.
ventricosa Sow.
Blanfordia bensoni A. Adams.
japonica A. Adams.
pyrostoma Cox.
striatula Menke.
viridescens Pease.
Cecina manchurica H. Adams.

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“ “ No. 4, 8-32	75	“
“ “ No. 5, 16-32	1 50	“
Blow-pipes, Glass, each 15c., 5 for	50	not mailable.
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VALUE OF STEAM IN TAXIDERMY.

Steam is generally used to soften the wings of birds so they can be spread, or the feet that they may be opened or closed. The positions of various portions of dried skins or mounted specimens, may, to a limited extent, be changed by its use. For all of the above uses it is valuable, insomuch as it saves time. The steam does its work quickly, but a few seconds' exposure being necessary; while the slower method of wet cotton, cloths, or sand, requires several hours, according to the nature of the specimens. Another advantage in favor of the former is, that while the latter keeps the specimens soft for a considerable time, steam dries away almost immediately.

It is also very valuable for restoring crumpled or bent feathers (not broken) to their original shape, though it *will not* interlace the webs if parted. Many taxidermists have doubtless tried steaming skins they intended to mount, but such as we have heard from were not pleased at the result.

The fact that steam will shrink skin may not be new, but we think its practical use in Taxidermy has but recently been discovered, and Mr. G. M. Gray, in our employ, has that honor. It was a purely accidental discovery, but, like many others, will come under —" necessity is the mother of invention." The facts of the case are as follows: We had mounted a small black and tan dog, the skin of which stretched so badly that we stuffed it a trifle too full, to dispose of the wrinkles. The owner was not satisfied, and wanted it made smaller. We agreed to do what we could to remedy the trouble, and turned the job over to Mr. Gray. He tried every conceivable way to make it smaller, but all to no purpose. The tea-kettle was steaming merrily, and as a last resort, he thrust the dog into the volume of steam pouring from the nose, then rubbed it down with his hand. After doing this a few times, to his surprise and pleasure, he saw the much desired object was being obtained, and a few moments later had the satisfaction of seeing the dog reduced all over to the required size. The owner also, was pleased.

We next experimented on a Roseate Spoonbill which had been mounted for five years, and of which the naked throat was badly wrinkled. This also was a success.

Still another trial was made on a rattlesnake, that had the skin so badly distended in places that some parts had to be filled much too full. These parts were worked down to be uniform with the rest. The snake was next coiled, and all of the kinks steamed out.

Since then we have made use of steam constantly, and keep the kettle ready to boil at nearly all times. We should be pleased to hear the results of experiments by others.

COLOR OF BIRDS' EYES.

If these observations differ from those of others, we shall be pleased to hear from them.

Black-backed Gull, adult, straw;* skin around eye, bright orange.
Herring Gull, adult, straw; young, hazel.*
Night Heron, adult, red; young, brown.
Snowy Heron, straw.
American Egret, straw.
Louisiana Heron, red.
Bittern, yellow.*
Little Blue Heron, adult, gray.
Great Blue Heron, straw.

---

*It is rather unfortunate that the colors of artificial eyes are in some cases mis-named. *Hazel* is the very dark, almost black, eye that most birds possess. *Straw*, the clear light yellow. *Yellow*, the deep color inclining to orange. If parties ordering will bear these points in mind, much confusion will be saved.

Among the Buff-breasted Sandpipers.

An unusually good day's collecting is not easily forgotten, and especially when several new species have been obtained. The following is the record of May 22, 1882, at Vermillion, Dak.:

At the outset, and before passing the limits of the town, I added a new bird to my list of captures, an Arkansas Flycatcher, or Western Kingbird, *Tyrannus verticalis*. The capture of a bird never before seen alive usually puts a naturalist in good spirits, so that while traversing several miles we were quite satisfied to pick up an occasional Bartram's Sandpiper, or Yellow-headed Blackbird. Our rendezvous was a slough—pronounced in the West *slew*—eight miles distant. Shortly after reaching it, a whirring of wings over my head caused me to look up, and a moment later I was the happy possessor of a fine pair of Hudsonian Godwits, or Ring-tailed Marlin, *Limosa haemastica*, second new capture. They were so fat that both were burst open on the breast by the fall. Another Western Kingbird was next added, and a third pursued, but not captured, because at this juncture a flock of birds flew by, which were immediately recognized as Buff-breasted Sandpipers, *Tryngites rufescens*. They alighted in a newly ploughed field and one was obtained, making the third new capture. The balance of the flock were hunted for, but vainly.

It being noon, we now sought a ravine in which to eat our dinner, for Dakota is, or should be, famous for high winds. While at our repast, hist! and about a hundred Golden Plover went over our heads so quickly, it was useless to attempt to shoot. Then a second and third *hist!* in quick succession, and two more flocks had passed. The Golden Plover fly very swiftly and but a few yards from the ground. Scarcely was our lunch over than a large flock of Buff-breasted Sandpipers went by, and we ran up the side of the ravine and saw them alight on a piece of newly burnt ground about two hundred yards away. When we reached the spot nothing was to be seen of them, but soon away they went from all about us.

Upon their alighting, we marked them down as closely as possible, and when within about two gun-shots, stopped for a short time, when the birds, gaining confidence, began feeding. When two or three were in range, we moved on and the birds stopped, and keeping our eyes riveted upon them until within shot, dropped them. Leaving my companion, who had no gun but a large basket, to pick up the birds, I noted where the flock dropped down, and hurried to the spot. This time they were in a low grassy place, where there was an inch or two of water, and clustered better, enabling me to pick four sitting and two flying. Here I threw down my hat, and, following the flock to another moist place, killed three or four more, which I picked up, and lo! they were Pectoral Sandpiper, *Actodromas maculata*, as were also the previous six, but the first were Buff-breasts. It was not till after killing sixteen Pectorals that we discovered the Buff-breasts did not visit damp places, which the Pectorals always did. At the report of the gun, all the birds within two hundred to three hundred yards would rise, fly around, intermingle, then divide, and each visit its peculiar feeding-place, and it was but natural to follow the largest flock, or the one which alighted nearest. A flock of large Plover were now espied coming, which flew near enough to enable us to drop two, but one, although marked down, could not be found, but was captured about half a mile away, two hours later. The balance of the afternoon was spent hunting the Buff-breasts, until our cartridges were well-nigh exhausted, and we had few left, except 4^s and 6^s. With the last charges of fine shot three Chestnut-collared Longspurs, *Plectrophanes ornatus*, were secured, fourth new capture. The sky being overcast and rain threatening, we moved homeward. Buff-breasts were then literally swarming, and flying from before us constantly.

We left the prairie with two baskets full of birds. Just before reaching town we found a fine Bittern, evidently just dead, which had probably died of a wound received a few days before. The number of birds obtained was sixty-four, of which twenty-eight were Buff-breasts. We also took three eggs that were just hatching from a Mallard's nest, from which we obtained fine young birds. All of the Sandpipers were very fat, and more than three-fourths of the Buff-breasts were females. The males are readily distinguished by their larger size, the wing and tarsus being strikingly longer. The markings on the under side of the wings are very beautiful.

Magnetic Sand.

ATTENTION has been called in the *Scientific American* to the Magnetic Iron Sand at New Zealand, and we now quote largely from an article by A. W. Brown, in the Providence *Journal*, relative to a similar sand, covering a few acres in the vicinity of the bathing-beach at Block Island. The particles of magnetite in this sand do not readily oxydize, and their brilliant faces reflect fiercely the light and heat of summer, severely trying to the eyes of one crossing there, and giving the whole place, when seen from a hill near by, the appearance of a dark cloud swimming in a quivering atmosphere.

This spot has been rented by New York parties since 1868, and after many experiments, they have been able to produce a variety of iron of peculiar fibrous structure, well adapted for placing between two pieces of iron, as a thin film of glue is employed between two pieces of wood, when the parts are to be united with unusual strength. This iron was called a "welding composition," and was sold for twelve cents per pound.

The sand is gathered on the beach in as pure a state as possible and carted to the place of separation, where it is dried, either by the sun or by means of artificial heat. From the dryer it passes by gravity into a large receiving bin, whence, by the buckets of an elevator, it is raised and dropped into a hopper having a long, narrow opening, nearly over the centre of a cylinder, made powerfully magnetic. All the non-magnetic portion, influenced by gravity alone, falls to the ground, while the iron particles, attracted by the cylinder, adhere to the magnetic surface. This nearly pure iron is packed into bags containing 112 pounds each. The separator, if properly fed and run, is guaranteed to separate two tons per hour from sand containing 33⅓ per cent. of magnetic ore. It separates one ton per hour with little care, and when working at its best, with sand of a high grade, it has delivered into the bags from four to five tons per hour. The largest results given were seldom obtained.

The product is a purely magnetic ore, of which several analyses show about the same results as those given below, obtained by a Brooklyn chemist from a sample taken at random from one of the bags:

Magnetic oxide of iron	87.22
Manganese oxide	1.06
Magnesia	0.72
Lime	1.60
Titanium oxide	4.10
Silica	5.30
	100 00

Mere traces were found of phosphorus and sulphur. The metallization, or per cent. yielded of actual iron, is marked at 63.15.

A few words may be permitted in relation to the amount of the Block Island deposit. A careful examination has been made, holes have been dug in several places to the depth of from ten to fifteen feet, and the ground sounded by iron bars nearly or quite five feet further. In several places black sand was found as deep as the holes extended, and to the bottom of every hole the mingled sand and cobble-stones of a beach formation, indicating that this part of the island has probably been built up by the sea. Encased in a rubber suit, Professor Jackson examined the bottom near the shore; and afterwards from a boat, he made careful soundings over a large area, using a strong magnet at the end of his line. For a distance of two miles eastward from the northern half of the island, the magnet invariably brought up magnetic ore, in some places gathering enough to serve as an armature. It was estimated that fully a million tons are readily available on land, while on the bottom of the sea, perhaps at a depth not too great to preclude the idea of obtaining it profitably, there is a much larger amount. Besides the sand which the separator removes, there is a large amount of black sand which is not magnetic, but is still richly metallic.

A New Volcano in Behring Sea.

SERGEANT Applegate, the signal-service observer at Unalashka, Alaska, reports that during the past summer a new volcano burst out from the bottom of the sea, latitude 54° north, longitude 168° west. "It has been exceedingly active, as it has already formed an island from eight hundred to twelve hundred feet high. According to the report of Captain Anderson, the discoverer, who sails one of the Company's vessels, and who went within two thousand yards of it, it presents a magnificent sight. The fire, smoke, and lava are coming out of many crevices, even under the water-line. Large bowlders are shot high in the air, which, striking the water, send forth steam and hissing sound.

The Shell-Bearing Mollusca of Rhode Island.

[BY HORACE F. CARPENTER.]

CHAPTER II.

CUVIER named the second grand type of animal creation Mollusca, from the Latin, *mollis* or soft, meaning soft-bodied animals. This term is not exclusively characteristic of this department of nature. There are many soft-bodied animals not included in the Mollusca, and there are also members of this group which are not wholly soft.

Mr. Edward S. Morse, of Salem, Mass., in a paper read before the Essex Institute, called " A Classification of Mollusca, based on the principle of Cephalization," proposed the name " Saccata," suggested by Alpheus Hyatt, as better expressing their plan of structure: the stomachs and viscera of *all* mollusks being enclosed in a fleshy sac, which, in the different classes, is open or closed at one or both ends; but as naturalists have not seen fit to adopt this change of nomenclature, we must continue at present to use that given by Cuvier. Linnæus was the first to systematize the study of animals and plants, and gave to each variety two Latin names, the generic and specific, viz.: *Mytillus edulis*, the edible mussel. Afterwards Cuvier established the system of the division of animal forms into types, classes, orders, and families.

The study of the *animals* of the type Mollusca, is called Malacology. Conchology is the study of the shells (secreted by the animals, forming the houses in which they live), together with descriptions of the habits, location, distribution, etc. In preparing these papers on the " Conchology of Rhode Island," I shall recognize only those mollusks which secrete a calcareous shell.

The Mollusca proper, excluding the Molluscoida (Brachiopoda, Tunicata, and Bryozoa), may be divided into two great groups, as follows:

1. Encephala. The animal possesses a head, and is usually, but not always, protected by a spiral, or otherwise univalve shell. Example, the snail.

2. Acephala. The animal has no head, and is always protected by a bivalve shell, or one consisting of two parts, connected at the back by a ligament, or hinge. Example, the oyster.

The Encephala comprises four out of the five classes into which the Mollusca are divided, and includes more than three-fourths of the whole number of known molluscous animals. These classes are:

1. Cephalopoda. These animals live in the ocean, and are found in all parts of the world. They are carnivorous in their habits. They have large heads, separate from the body portion; the name of the class is given to it from the mouth of the animal being surrounded by eight or ten long fleshy arms, or feet, and arising from the top of the head.

2. Pteropoda. These animals also inhabit the ocean, swimming by means of a pair of wings extending laterally from the back of the head.

3. Gasteropoda. The under side of the body forms a muscular foot, by which they crawl along, dragging the shell after them, to which they are attached by the mantle.

4. Scaphopoda. The shell is a hollow cylinder, open at both ends; the animal with a rudimentary head; foot vermiform, furnished with lobes.

5. Acephala. This term is synonymous with Pelecypoda, Lamellibranchiata, and Conchifera, the meaning of which will be explained in its proper place.

CLASS 1. CEPHALOPODA.

This first and highest class of the Mollusca is divided into two orders:

1. Dibranchiata. Breathing by a single pair of branchiæ or gills. Mandibles, horny. Arms, eight or ten, furnished with rows of suckers. Shell, internal or none.

2. Tetrabranchiata. Breathing by two pair of branchiæ. Mandibles, shelly. Arms, very numerous, without suckers. Shell, external, chambered; capable of containing the animal.

ORDER 1. DIBRANCHIATA.

Sub Order 1. Octopoda. Arms, eight, sessile; no shell.

Sub Order 2. Decapoda. Arms ten, eight of which are sessile, and two (longer) tentacular. Shell internal.

Sub Order 1, Octopoda, consists of three families, containing thirteen genera, and eighty-three described species, none of which having shells, are all excluded from these papers on " the Shell-bearing Mollusca of Rhode Island."

Sub Order 2, Decapoda, consists of eleven families, containing fifty genera, and about one hundred and fifty recent species, and as many more fossil. The only shell represented in Rhode Island of this immense order is

SPIRULA PERONII, LAM.

Shell nacreous, cylindrical, conical, tapering, the whorls separate from each other and chambered.

Although thousands of shells of these pelagic mollusks are washed ashore in all parts of the world, the animal is almost unknown, two perfect specimens only having been found in New Zealand. Its habitat is in the tropical Atlantic and Pacific oceans. Specimens of the shells have been drifted upon the island of Nantucket, which is the nearest place to our state they have ever been found, but they may as well be looked for on Block Island or the ocean shores of our state.

ORDER 2. TETRABRANCHIATA.

This order contains two families, Nautilidæ and Ammonitidæ.

Family 1. Nautilidæ. Septa simply curved, concave on the outer face, sutures simple, undulate or lobed; mouth simple; siphonal opening nearly central. Shell smooth, or but little sculptured. Six living and about six hundred fossil species.

Family 2. Ammonitidæ. Septa convex in their median section, sutures complex, lobed, ramified or denticulated; septal tube cylindrical and directed forwards; siphuncle cylindrical small, marginal. Fossil only, about sixteen hundred species, varying in size from less than an inch to over three feet in diameter.

Several of these enormous Ammonites are represented by artificial models, lying around on the shores of the Secondary Island, so called, in the grounds of the Crystal Palace, at Sydenham, Eng. On this island, in the centre of an artificial lake, it is intended to represent all the extinct animals of the Secondary Formation, restored by means of models, built life-size, and standing or lying in such positions as to show to the best advantage their uncouth and unwieldy forms. Among others may be mentioned the Iguanodons (vegetable feeding lizards), who, in their turn, formed the prey of still larger carnivorous animals. The great size of one of these Iguanodons will be appreciated by the fact that on the last day of the year 1853, twenty-one scientific gentlemen dined inside its body. Though not as large as some of these extinct monsters, it contains six hundred and fifty bushels of artificial stone, one hundred feet of iron bars, and six hundred bricks.

[*To be continued.*]

Dynastes Hercules, one of the largest Beetles in the World.

THIS wonderful insect is, we learn by reference to the works of the Rev. J. G. Wood and Mr. J. A. Ober, a native of Guiana, and is never found out of South America, except in the island of Dominica. It burrows in the ground or under decaying leaves, etc., during the day, and is strictly nocturnal, flying high among the trees, probably seeking mates. This tends to make it difficult to obtain. The natives call these beetles Razor-grinders, and it is stated that they use their horns like a thumb and finger clasping a small branch of a tree, and by whirling rapidly around it, cut it off.

The males that we have examined have measured from four to six and a half inches in length, the thorax horns from two and three-quarters to three and one-half inches long. The elytra are sage green with black spots and dashes, and black margins around their whole circumference. The thorax black and glossy, extended into the long horn, which is thickly set below with yellow-brown hairs; scutel black, the under parts very dark brown, with an abundance of yellowish hairs; legs black and about one and three-quarters inches long. Two small protuberances near the base of the upper horn, and upon the head a black horn one and one quarter inches long, compressed, toothed at the end, and at about half its length two more short teeth.

The female is about three inches long, the elytra one and five-eighths inches long, and one and one-half wide, dark brown tinged with dull green, and somewhat spotted posteriorly, three longitudinal ribs on each, and roughly honeycombed. The head dull black, with a rudimentary horn; thorax rusty black, and rugose, the rusty shade occasioned by short brown hairs; all the under parts dark brown or black, and very closely punctured. The larva lives in, and feeds upon, rotten tree trunks and branches, and is a marvel to look upon. We have just had the privilege of examining an alcoholic specimen. Its full length was eight and one-half inches; circumference, four and five-eighths inches, a little larger at the ends than in the middle. The general color was light fawn brown, this may have been intensified by the spirits in which it was preserved, the head and very powerful mouth parts were black, the head punctured all over and with a few brown hairs. Number of segments, fourteen. No prop legs, but three pairs of dark, red-brown, hairy legs on the first three segments. Four small tubercles on each side, on the first and second segments, followed by ten large tubercles, one on each succeeding segment. A large, somewhat triangular shaped spot of brown on each side of the first segment, and small, round, black or dark brown spots on all the others, except the second and third and the last two. Light brown hairs about one-eighth of an inch long are sparsely scattered all over the body, thickest on the first six and the last segment.

Viewed from above, the back is so wrinkled as to appear to be made up of twenty-nine segments. It is reported that the natives find morsels of this sort very toothsome, and verily, half a dozen of them would make a hearty meal.

Dynastes Tityus.

A North American species occurs to our knowledge as far north as Pennsylvania; some specimens from North Carolina now before us look, at first, like miniature D. Hercules; they vary considerably in general color and marking, but these are about as follows: The male is two inches long, exclusive of the horn, the horn upon the thorax is one-half inch long, notched at the end, and is black, faced below with yellow-brown hairs, the black horn upon the head is nine-sixteenths long; thorax and horn one inch; elytra one and one-fourth inch. The general color is light or whitish green, more yellow on the thorax at base of horn. Scutel black, with a green spot in the middle. The elytra bordered all around with black, a row of fine black punctures on each side of the dividing line, and clustered thickly about the corners next the scutel, a quantity of small black spots and rings scattered irregularly over them, also a few hair-like scrawls; the thorax is sparsely marked with similar lines; two horns, each three-sixteenths long, appear at the base, just below and on each side of the thorax horn; these, with the front of the thorax and head, are black. Antennæ black and palmate. All the under parts and legs, dark red brown, finely punctured in the middle portions and set about with yellow-brown hairs, which on the abdomen protrude one-eighth of an inch beyond the elytra.

The female is one and three-fourths inches long, no horn upon the thorax, and just a suggestion of one on the head. The head and thorax are of a smoky, greenish black, thickly punctured, and somewhat broader than in the male, which she is otherwise like in general appearance, except that the elytra are a duller green, more punctured, and have very few black spots. In the new book, *Insects Injurious to Fruits*, by Wm. Saunders, is an excellent cut and description of this insect.

THE PROVIDENCE FRANKLIN SOCIETY held its annual meeting Jan. 1, 1884. The reports of the various officers show that during the past year, ten papers have been read before the Society, and that five excursions have been made under its auspices. New names have been added to its membership, and its working force remains as large as ever. The treasurer's report shows that the receipts for the year have covered the expenses, leaving a margin of two hundred dollars for the new year. The cabinet keeper, Mr. T. R. Shurrocks, reported one hundred additions to the collections. The election of officers resulted in returning the entire board of the past year.

President — L. W. Russell.
Vice-President — D. W. Hoyt.
Secretary — C. M. Salisbury, Esq.
Treasurer — A. L. Calder.
Cabinet Keeper — T. H. Shurrocks.
Librarian — Frank Titcomb.

Two weeks later, Mr. C. R. Kruger lectured upon *Photography*, giving a clear and connected explanation of the steps and processes of the present methods, and reviewing many of the past.

Last month, we recorded two Brunnich's guillemots killed in Narragansett Bay, and have now ten more to report from the same locality. Also another Night Heron killed at Bristol, R. I., Jan. 10, 1884.

About Insects.

Professor Elliot, of New York City, is conducting some interesting experiments to test the sensibility or insensibility of insects to pain. A dragon-fly was fastened to a board and its abdomen severed from the rest of its body. The latter was then fed to the insect by piecemeal, which it ate with evident relish, the parts eaten of course dropping out of the severed end. Having eaten its own abdomen, it was served with six spiders and sixty flies, swallowing them all and losing them immediately, evidently suffering no pain.—*Scientific Times.*

ALBINISM.

We have frequent opportunities to observe albinistic tendencies in animals as well as birds, and think that with the gray squirrel, *Sciurus carolinensis*, it is not uncommon. Two specimens have come to our notice within the past three months, both taken within ten miles of Providence. Another has been reported from the vicinity of Greenfield, Mass., and yet another near Brooklyn, Conn., while each past year we have had, or have heard of, one or two specimens.

Nov. 13, 1883, we received a muskrat, *Fiber zibethicus*, mottled all over, above and below, with silvery-white in large patches, the tail half brown, half white. Three of the legs and paws white (the other was lost in the trap), all the brown color on the breast and belly very light, and the eyes hazel. This specimen was taken in Cranston two days before we received it, and is now in the Museum of Brown University. Another, still more nearly white, is reported as taken at the same time, but being in some way damaged, it was thrown away as useless.

A King Eider, *Somateria spectabilis*, was shot at Nayatt Point, Bristol Co., R. I., about Jan. 1, 1884, by Mr. Frank Tobey. It was an adult male. This is not the first record for Rhode Island, Mr. F. B. Webster having a female, which was taken at same place Nov. 27, 1879.

Purple Finches, *Carpodacus purpureus*, are common this winter. They must be wintering in the North in considerable numbers also, for we received about seventy on Jan. 15, killed near the Rangeley Lakes in Maine.

Stuffed Spiders.

When it comes to a real live, energetic, ugly, vicious, poisonous spider, says the Santa Barbara *Independent*, Southern California can enter prize animals at any fair. The most precious trophies the tourists bear away from this coast are, in all probability, the neat cards decorated with these monsters of the insect world. Every one is familiar with the trap door and nest of this cunning but ugly creation, and of which strange little habitations every adope ranch is full. So densely populated with these beautifully lined tunnels are some of the sunny, quiet valleys among the foot hills, that close inspection will reveal their almost invisible trap doors hardly a foot apart. Yet, in spite of this, hardly a living animal will be seen. There is a legitimate demand for prepared specimens, both at wholesale and retail. When first brought in they are deprived of what life is left in their bodies by poisonous fumes or other application of poison. After the taxidermist has made sure they are quite dead—a wise precaution—he cuts them open on the under side and, removing the loose matter therefrom, carefully stuffs them with cotton. This stuffing process is quite a delicate operation, and requires no little knack to perform neatly and successfully, without injuring the animal, and bringing it back to its normal shape and size. A humming-bird would seem to be about as small an object as could easily be put through this painstaking operation, let alone an insect even of the size of a tarantula. This having been completed, the spider is placed upon a board and properly held in position by pins, one through the body and one in each foot, and set in the sun to dry.

The sale of them in Santa Barbara is carried on both at wholesale and retail, several parties carrying on the business, the supply seeming never to crowd the demand. In spite of their great numbers, few instances occur where people have been bitten by them, the tarantulas generally being more anxious than the other party to get out of the way.—*Scientific American.*

CONCHOLOGICAL CHECK-LIST. II.

J. RITCHIE, JR.

Order. Pneumonopoma Pfr.
Sub-order. Opisophthalma Pfr.
Family. Diplommatinacea Pfr.
Diplommatina affinis Theob.
anamalayana Bedd.
angulata Theob. & Stol.
austeni Blanf.
australiae Benson.
bensoni A. Ad.
blanfordi Benson.
burti G-Austen.
canarica Bedd.
cantori Pfr.
capillacea Pfr.
carneola Stol.
ceylanica Bedd.
chordata Pfr.
convoluta G-Austen.
costulata Hutt.
crispata Stol.
depressa G-Austen.
diplocheilus Benson.
distorta Mouss.
exilis Blanf.
fairbanki Blanf.
folliculus Pfr.
gibbosa Blanf.
godeffroyana Mouss.
gracilis Bedd.
homeri G-Austen.
huttoni Pfr.
insignis G-Austen.
jaintiaca G-Austen.
jatingana G-Austen.
kingiana W. & H. Blanf.
labiosa Blanf.
levigata G-Austen.
liricincta Blanf.
macgillivrayi Pfr.
macrostoma Mouss.
minima Bedd.
minor A. Ad.
nana Blanf.
nilgirica Blanf.
nitidula Blanf.
oligopleuris Blanf.
Diplommatina pachycheilus Benson.
parvula G-Austen.
pedronis Bedd.
polypleuris Benson.
pullula Benson.
pulneyana Blanf.
puppensis Blanf.
richthofeni Theob. & Stol.
salwiniana Theob.
scalaris Blanf.
scalaroides Theob.
semisculpta Blanf.
sherfaiensis G-Austen.
sperata Blanf.
subovata Bedd.
tricincta Balf.
tuberosa Mouss.
tumida G-Austen.
ungulata G-Austen.
Moussonia fuscula Mouss.
problematica Mouss.
typica Semper.
Palaina alata Semper.
constricta Martens.
dimorpha Semper.
inflatula Semper.
lamellata Semper.
martensi H. Adams.
moussoni Semper.
patula Semper.
polymorpha Semper.
pupa Semper.
pyramis Semper.
ringens Semper.
strigata Semper.
striolata Semper.
Clostopsis sankeyi Benson.
Arinia minor Sow.
scalatella Dohrn.
Paxillus adversa H. & A. Adams.
beccarii Issel.
lyratus Gould.
peregrina Gould.
rubicunda Mart.
tantillus Gould.

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Crimson House Finch	.08
English Sparrow	.03
Song Sparrow	.04
Cardinal Grosbeak	.13
Cow Bird	.03
Baltimore Oriole	.08
Purple Grackle	.05
Scissor-tail Flycatcher	.20
Wood Pewee	.15
Chaparral Cock	.45
Osprey	.35
Black Vulture	.85
Bob-white	.10
Louisiana Heron	.20
Green Heron	.10
Killdeer Plover	.25
Spotted Sandpiper	.10
Florida Gallinule	.15
Blue-winged Teal	.25
Snake Bird	.30
Laughing Gull	.20
Common Tern	.10
Black Guillemot	.22
California Guillemot	.35
Blue Bird	$ .05
Black cap Chickadee	.12
Yellow Warbler	.05
Red-eyed Vireo	.10
Cedar Bird	.10
American Goldfinch	.07
Grass Finch	.05
Lark Finch	.18
California Brown Tohee	.15
Black-headed Grosbeak	.20
Red-wing Blackbird	.03
Brewer's Blackbird	.08
Boat-tailed Grackle	.15
Crow	.08
King Bird	.04
Flicker	.05
Screech Owl	.50
Cooper's Hawk	.30
Wild Turkey	1.00
California Quail	.19
Snowy Heron	.15
Little Blue Heron	.25
Wilson's Plover	.40
Clapper Rail	.15
Sora Rail	.15
American Eider	.30
Black Skimmer	.20
Gull-billed Tern	.25
Least Tern	.13
Common Guillemot	.30
Brunnich's Guillemot	.30

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We will allow the affixed prices for the following list, and give in exchange from the one below. They must be nicely side blown, and either sets or single, unless sets are specified. This offer annulled March 15, 1884.

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Yellow Warbler	.03
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Cedar Bird	.08
Bank Swallow	.03
Scarlet Tanager, *set*	.20
Grass Finch	.04
Chewink	.10
Rose-breasted Grosbeak	.20
Baltimore Oriole	.07
Bronzed Grackle	.07

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Phœbe Bird	.04
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Least Flycatcher	.07
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Common Crow	3, 4, 5, @ 15c.
Scissor-tailed Flycatcher	3, 4, @ 35c.
California Quail	8, 9, 10, @ 30c.
Louisiana Heron	2, 3, @ 30c.
Wilson's Plover	3, @ 60c.
Clapper Rail	5, 6, 7, 8, @ 20c.
Sora Rail	6, 7, 8, @ 20c.
Brown Pelican	2, 3, @ 25c.
Laughing Gull	3, @ 25c.
Gull-billed Tern	2, 3, @ 40c.
Forster's Tern	2, 3, @ 35c.
Least Tern	2, @ 20c.
Leach's Petrel	1, @ 25c.
Brunnich's Guillemot	1, @ 35c.

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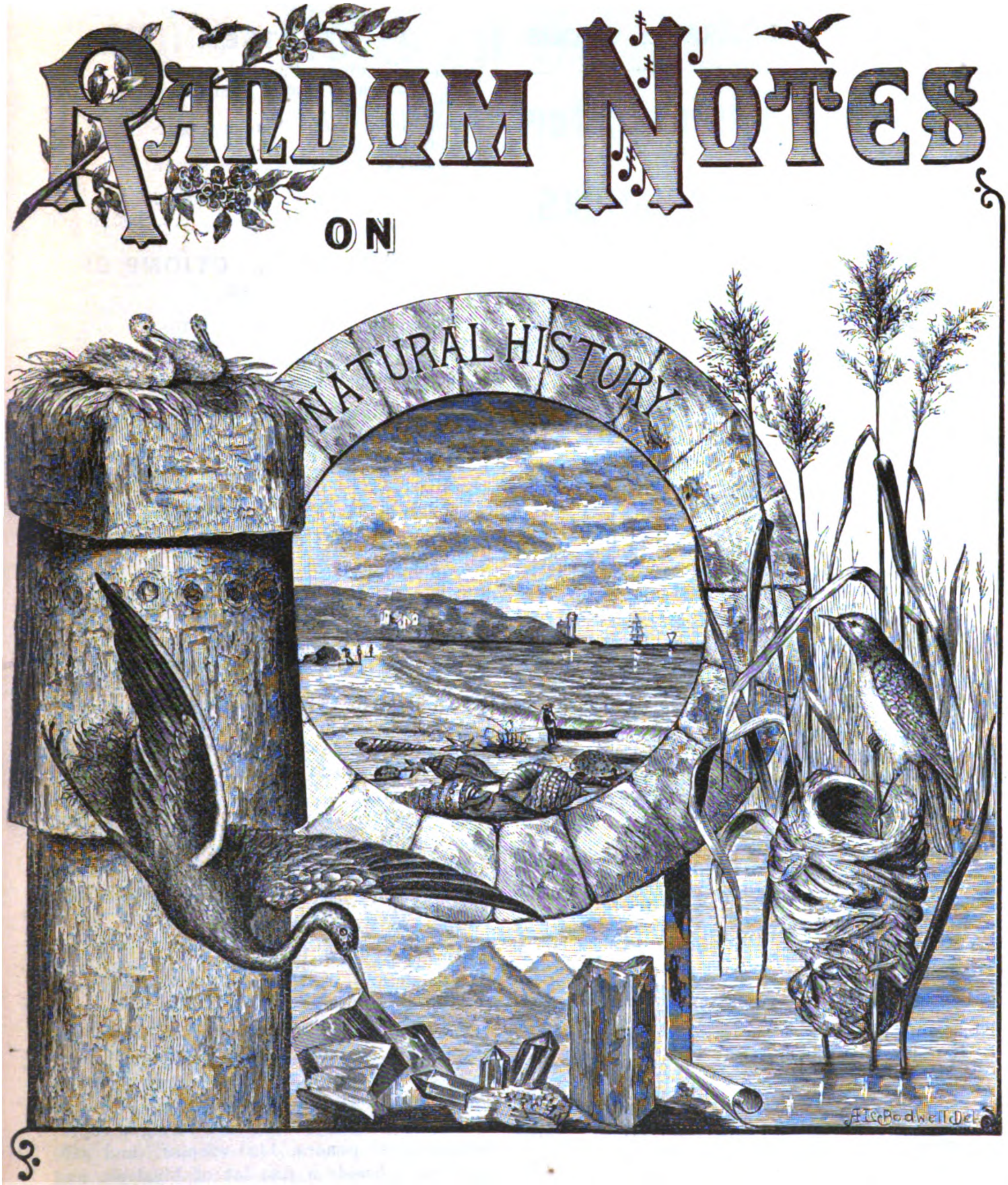

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Box Tortoise (Cistudo Carolina), R. I., Mass	1.50
Speckled Terrapin (Nanemys guttata), R. I.	1.00
Painted Terrapin (Chrysemys picta), R. I.	1.00
Snapping Turtle (Chelydra serpentina), R. I.	2.00 to 4.00

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Collection No. 1 contains 50 Birds, representing 20 different families.	25.00
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These birds are in the form known as skins, which is the most convenient shape for handling and study. All will be correctly labeled with both *scientific* and *common* names.

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Two hundred minerals and rocks, labeled and arranged in trays, and representing all the prominent species in systematic mineralogy, 100.00

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125 minerals and rocks in trays and labeled. 50.00

20 good minerals, named, but of small size, by mail, prepaid 1.00

We have now a large lot of *Catlinite*, from Pipe Stone, Minn., (see page 8) .10 to 1.00

SHELLS.

Spondylus pictorum Chem., Cal.	3.00 to 8.00
Hemicardium unedo Lin, N. S. W.	.10 to .25
Neritina helvola, Ged., Feejee Is.	.05
Nerita plexa Chem., Mozambique	.15 to .25
Littorina scabra Lin, Fla.	.05
Pecten ziczac Lin, Bermuda	.25 .40
Semicassis Sulcosa Born, Med'n Sea.	.40 .75

Within a few days another particularly well-selected collection of SHELLS has been placed in our hands for sale. The specimens are nearly all marine, and most of them foreign, represented by 85 genera, 1420 species, and 4523 specimens, beside a fine lot of bivalves, and fluviatile shells, not entered in the catalogue, together with a black walnut cabinet of forty-five drawers. Price, $700.

In any Quantity or any style, **GLASS EYES,** Sent Postage Paid.

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Random Notes on Natural History.

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Random Notes on Natural History.

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258 Westminster St., Providence, R. I., U. S. A.

SPECIAL NOTICE.

Subscriptions hereafter will begin with the current number, or the March number if desired.

We laid by what we supposed a liberal quantity of January and February numbers, but the rapid increase of our subscription list has nearly exhausted our surplus of those numbers.

We will pay ten cents each for the return of either January or February numbers in good condition, and those desiring them will be supplied at the same price.

Beginning with the March issue, we shall lay by a sufficient number to prevent the above occurrence in future.

That children have eyes, and use them; that they have tongues, and use them; and that they think, is unquestionable, the limit, in each case being the natural powers of the child. What more sensible plan can be adopted, than to take these powers when they are in natural and active operation, and train them easily and naturally, but surely, in the proper direction?

The awakening of mental activity being taken as the foremost aim of zoölogical study for children, it follows that there must first be an interest awakened,— no, not awakened, but encouraged. It will be hard to find a child of five or six years, whose mind gives evidence of ordinary power, who has not already an interest in the study of animals. Cats, dogs, horses, cows, flies, butterflies, etc., are just as surely, and just as naturally, matters of interest to a child as a pool of water is to a young duck,— not necessary to its *existence*, but essential to its happiness and fullest development.

The teacher, then, needs only to encourage the child in the exercise of this natural impulse, taking care to so direct the effort that the results shall not be dissipated into vague and shadowy "notions."

It is a matter of marvel that teachers have not more generally recognized the immense value of nature-study as a basis for language-work. The abundance and variety of material for study, and the interest the children take in the work, should be unanswerable arguments; yet hundreds of teachers, at the mere mention of the beautiful study of insects, exclaim with a shudder, "Ugh! I wouldn't have the nasty things around."— *Chas. H. Ford*, *Journal of Education*.

We have to report three more cases of death among animals from curious causes.

A Biddeford gentleman, having occasion to go into his wood-shed, found a weasel lying dead on the block, with his tongue frozen to an axe blade. The axe had been used in cutting beef in the morning, and the animal in attempting to secure a piece of the meat which adhered to the blade, had singularly met his death. — *Cotton, Wool and Iron*.

Some time since, a specimen of the Little Black-head Duck (*Fulix affinis*) was brought to us with an edible muscle (*Mytillus edulis*) firmly fastened to its tongue. The duck must have closed its beak on the open bivalve, which in turn closed upon the tongue. The duck in distress flew at least four miles, and was seen to fall, nearly choked to death, completely exhausted, and an easy capture.

An esteemed correspondent from Pennsylvania writes that a gentleman riding through a rough piece of country, saw a fox run out in front of him. Trotting a little way, Reynard sprang up a slight elevation, and crouching under a shelving rock, turned and watched the carriage. The gentleman, alighting, threw a stone with such precision that it struck him squarely in the head and killed him at once.

The Roseate Spoonbill in Florida Rookeries.

With the exception of perhaps the Flamingo and Scarlet Ibis, there is no bird in our fauna so truly tropical in appearance as the Roseate Spoonbill, *Ajaja rosea*. It is called in Florida, Pink Curlew — accent on last syllable — and the Seminole Indian name is A-la-loo-la-set-teé.

My acquaintance with this bird was in 1874, when I was just beginning my collecting career, and my enthusiasm was unimpaired. I had seen only the young Spoonbill, which is of a light pink color nearly all over, and should have been quite satisfied to have secured even these. The reports received, however, were very discouraging, one party presuming to state that their destruction had been so great, that probably not one hundred remained in Florida. As may be imagined, our expectations were not great, but there was for us more in store than our fondest dreams had hoped to realize. But to return to the beginning.

We were encamped eight miles west of Fort Pearce, which stands nearly opposite to Indian River Inlet, and all of our ramblings were in Brevard County. We had been to one rookery on Feb. 28th, but it was a small affair, only American Egrets and Snake Birds breeding in it, and we obtained but few eggs. But now our guide said he would take us to a larger one where the Spoonbill was breeding. But we believed him not, for the previous fortnight had chronicled only disappointments. After various delays we obtained a *boat*, if such it could be called, but *scow* would be more appropriate, for it was a square-ended contrivance, twelve feet by four feet. This was placed upon the ox-team and all our camping equipage put into it, and a start made March 6th.

There is so little of interest in the pine woods that cover most of the high land, that we will pass to our entrance of the Seventeen Mile Swamp, said to be the headwaters of the St. Johns River. This tract is not properly a swamp, but is inundated by the rainy season, and at the time of our visit the water covered it to a depth of six to twelve inches. Here and there were places entirely uncovered, and numerous snipe borings were to be seen. Two weeks previous, Wilson's Snipe were very plentiful, but only an occasional straggler now remained, the greater portion being *en route* north. Throughout this great expanse, dotted here and there were what we were pleased to call oases, likening this watery waste to a desert. These oases are called "hammocks," but are properly hummocks.

These are the fertile spots upon which is a luxuriant growth, of which the Cabbage Palm figures most prominently. These fertile spots were generally small, from a few square yards to an acre in extent. This watery tract presented a grand appearance, for, grouped in every direction, were the herons engaged in feeding. There were the strikingly graceful forms of the American Egrets and Snowy Herons, a bold contrast among their dark cousins, the Louisiana, Great Blue, and Little Blue Herons.

Their forms, as with measured strokes they flew, their feet extended behind, and their necks recurved so that their heads seemed to protrude from their breasts, were in marked contrast to the swift-flying rows of White Ibis, with their necks extended. Occasionally a few Gannets (Wood Ibis) appeared, or some Sandhill Cranes, while the Turkey Buzzards and Carrion Crows were rarely absent from the scene. But the most peculiar bird of all is the Snake Bird, commonly called Water Turkey, *Plotus anhinga*. Its wings and tail are large, while its neck is long and very slim, and as it sails about in the air it resembles an ace of clubs with a single line drawn from the joining of the three lobes. These sights, as well as the various notes of the birds, among which the loud notes of the Sandhill Crane were most noticeable, all served to keep up a thrill of excitement. We chose for our camp one of the largest of the hammocks, and I was left to put it in order while my companion went to the rookery with the boat. On his return he reported seeing Spoonbills, and we were in ecstasies. Our team was now dismissed for a week, and we were left about ten miles from any human habitation, and five miles from the edge of the swamp.

With the gobbling of the Wild Turkeys at daybreak we were awake, and shortly afterwards a Cardinal Grosbeak tuned his mellow whistle but a few yards away, while several Jackdaws (Boat-tailed Grackle) were boiling over with music, one would think, to see them swell up in their vain attempts to make some, but in the production of which they are not more fortunate than the Purple Grackles and Cow Birds.

(To be continued.)

LIEUT. A. W. GREELEY.

WHAT the present circumstances of this investigator of Arctic phenomena and his associates may be, is probably a matter of as much general interest, throughout all civilized countries, as any one subject that could be mentioned.

A. W. Greeley was born in Newburyport, Mass., March 27, 1844. The writer remembers him as a member of a higher class at the Brown High School in Newburyport, a fellow quiet and studious, familiarly known as "Dolph'," and with no lack of energy at games. His stamina and nerve were exhibited one spring day, when, in tumbling over a fence, he broke his arm. Making no complaint, he sat quiet and very pale, until some method was devised for taking him home. After graduating from the above school at the age of seventeen, he joined the 19th Massachusetts regiment of volunteers, and remained in the service to the end of the war. He attained in the volunteer service the rank of captain and brevet major. He made one of the forlorn hope at the storming of Fredericksburg, in December, 1862, was in twenty engagements and fourteen pitched-battles, and was three times wounded; after the riot of July, 1866, he played an important part in New Orleans, and was appointed lieutenant in the Regular Army, in March, 1867.

For thirteen years he has been on duty as an officer of the Signal Corps, part of his duties being the construction, superintendence and inspection of telegraph lines. In this capacity, he built at one time an extreme length, coming inside in its completion, of the estimates, both as to time and expense, this having been previously declared an impossibility. At another time he visited the signal station on Mt. Washington, in the winter, and making the descent alone, was overtaken by a storm and lost his way. Wandering about, benumbed and bewildered, he finally came to shelter, but none too soon. As the result of his exposure and suffering he was laid up for some weeks. As Assistant Chief Signal Officer, he became known to the Country as "Old Probabilities," grinding out the weather, as he said. He paid close attention to international meteorology, and was called upon to give advice before the Jeannette Search Board, relative to winds and weather in the Arctic. As official predicting officer, he successfully indicated four days in advance the weather for presidential election day. He was finally appointed to take command of the Lady Franklin Bay Expedition, and sailed away from St. Johns, July 7, 1881. His diary-letter, sent back by the "Proteus" to his relatives, says: "We start with the bluest of skies and the fairest of weather.

July 12. We now have continuous daylight; large print can be read on deck at midnight. The temperature is 34 to 44 degrees and very comfortable. I enclose a specimen of the Arctic poppy.

Aug. 1. Lieutenant Lockwood killed a walrus as large as an elephant. It came at the boat in a great rage, and is said to have been terrible in aspect.

Aug. 3, 4.10 P. M. The sea is smooth as a mill pond, with here and there a thin film of last night's ice. Temperature 37^5 degrees, and the entire absence of wind makes it seem like a May morning in New England.

Aug. 4. We are delayed by ice for the first time, only eight miles from our destination, and here white whales, a sword-fish, and a norwhal are reported.

Aug. 11. Arriving at the situation for a permanent camp, a herd of eleven musk-oxen was discovered; the men following the herd killed them all. I gathered enough sorrel for a nice salad. Lieutenant Lockwood reports near at hand coal of nice quality and easily accessible.

Aug. 17. One of the party caught an humble-bee."

Selections have been made here and there from the diary, which gave also a more full account of the manner of landing, the putting up of their house, and the unfortunate death of some of their dogs, mentioning also Lieutenant Kislingburg, and Dr. Parry who had already made valuable collections of specimens in many departments.

The unfortunate result of the 1883 expedition for their relief is well known. Immediately on the opening of navigation, the government will dispatch a thoroughly equipped relief party. Three vessels have been secured. Several of our best naval officers have volunteered for the service, and also a number of seamen of Arctic experience.

LONSDALE BOTANICAL AND FIELD NATURALIST SOCIETY.

Organized Dec. 9, 1880. This society was formed and established for the study of Botany and other branches of Natural History.

The above society held its regular meeting January 21st, when the following officers were elected for the present year:

President—Ralph Drabble.
Vice-President—James Moss.
Secretary—John Dearden.
Treasurer—James Isherwood.
Librarian—William T. Butler.
Executive Committee—James Isherwood, Thomas Barber, John Osborne, James Lord.

At the close of the business meeting the president exhibited fine microscopical specimens.

The society is in a flourishing condition, having more than forty members, a well stocked library, and a comfortable sum in the treasury. At the next regular meeting the secretary, John Dearden, will read a paper on insects, injurious and beneficial. Meetings held monthly.

RHODE ISLAND ENTOMOLOGICAL SOCIETY.

The last regular meeting was held in their new room, 54 North Main Street, the largely increased membership and need of larger and better accommodations having made a change necessary.

Prof. A. S. Packard spoke at some length upon the ravages of the moth, *Tortrix fumiferana* among the spruce trees, on and adjacent to the coast of Maine, exhibiting perfect insects and chrysalis, and drawings of the larvæ.

At a previous meeting Mr. S. Schofield read a paper and illustrated it by diagrams, upon the difficulties he had experienced in raising from the eggs, the larvæ of *Eacles imperialis*, the Imperial Custard Moth.

THE PROVIDENCE FRANKLIN SOCIETY

has held its regular meetings. Prof. W. W. Bailey occupied one evening with an account of the Royal Botanical Gardens at Kew, Eng., and the influence of that institution in making botanists throughout the English colonies, and in collecting and distributing seeds and plants. The herbarium there is the finest in the world, and the identity of plants is ascertained as a final resort through Kew. Their museum of economic botany was at first the only one in the world, but this example is now being followed in other places, at Berlin, Ghent, Paris, and Boston. At a later meeting Mr. T. R. Shurrocks spoke upon the different forms and appearances, and the alterations of pyrite.

AN UNUSUAL BOUQUET.

By the kindness of Mr. S. Schofield, we saw last breeding season, a bouquet about fifteen inches across the top, of apple tree twigs, full of fresh leaves, and on them were feeding fourteen larvæ of *Platysamia cecropia* in fine healthy condition. A bunch like this placed in a pint of water, replenished daily, will keep fresh three days; it may be kept standing anywhere, and the larvæ, though perfectly free, will not attempt to crawl away so long as fresh leaves are plenty. Mr. S. experimented with many sorts of leaves. None kept fresh so long and seemed to please as well as the apple.

He observes also that when first hatched the larva is one-quarter of an inch long, and nearly black. In about eight days it sheds its skin and appears in a brown coat (although one retained its black). About ten days later occurs a second moult, or casting of the skin; it then appears of a beautiful green color, with numerous short nodular protuberances, four of them near the head, of a bright coral color, the others yellowish, greenish or bluish, and each surmounted with a star of short black hairs. At the next moult, of which there are four, the coral fades to an orange, and after each moult the larva eats up the old skin. When about ready for a change of dress, it feeds less for three or four days, and lies quiet. Suddenly the skin cracks at the head and comes off in a moment, and is nearly transparent. After the final feeding the larva, selecting a twig to its fancy, proceeds to spin the well-known brown silky cocoon.

Who says it is unhealthy to sleep in feathers? Look at the spring chicken, and see how tough he is.—*Exchange.*

How to find a chip of the old block—Axe the block.

The Shell-Bearing Mollusca of Rhode Island.

[BY HORACE F. CARPENTER.]

CHAPTER III.

CLASS 2. PTEROPODA.

THE pteropods are all small mollusks, some of them microscopic; they are commonly known as sea-butterflies and whale food. They spend their entire existence in the open ocean, but are sometimes seen at rare intervals drifted upon the shore. They are brought up by the dredge, in the fine sediment from the bottom of the sea, at great depths. In the arctic regions, they exist in immense numbers, discoloring the waters for miles. They form the principal food of the Greenland whale and of many sea-fowl. These animals are carnivorous; they have heads, but no eyes; some species are destitute of a shell, others are protected by an external, testaceous, or membranaceous covering of variable form, with or without opercula; still others have an internal shell. They ascend and descend with great rapidity, and swim by means of a pair of wings situated near the mouth. The different species swim near the surface at certain definite hours of the day and night, remaining but a short time, then sinking, to be seen no more until the following day at the same hour. As one species disappears, another takes its place, and they pursue this endless routine throughout the whole twenty-four hours. One rare species is only seen at 12 o'clock, P. M.

The sexes are united in the same individual. They comprise two orders, *Thecosomata* and *Gymnosomata*; five families, Hyaleidæ, Cymbuliidæ, Limacinidæ, Cliidæ, and Eurybiidæ. There are forty-seven genera and sub-genera, and more than two hundred species, recent and fossil.

The pteropods are infrequent visitors to the New England coasts; *Spirialis flemingii* occurred at Nahant, Mass., in great numbers during the summer of 1863. Mr. Alexander Agassiz gives an interesting account of their habits in the *Proc. Bost. Soc. Nat. Hist.*, vol. x., p. 14.

CLASS 3. GASTEROPODA.

These animals are the highest in the scale of being of all the Mollusca, excepting the Cephalopods. They occur in immense numbers, and are represented everywhere; in the ocean, in all fresh water lakes, ponds, rivers, and stagnant ditches; in swamps, in lowlands, and upon the highest mountains; in forest, meadow, and in gardens; on trees, on walls, and sometimes, even in our houses. The species are numbered by thousands, almost every island in the ocean having species peculiar to itself. They are also found on the bottom of the sea, on the sands of the shore, attached to rocks and sea-weeds, and floating in mid-ocean; one species, *Janthina fragilis*, secretes a shell, white on the upper half, and of a beautiful violet color on the lower portion. The animal constructs a raft or float, several times the length of its shell, and loads it with eggs. The animal has not the power of sinking and rising to the surface, but floats along with its raft of eggs attached to its foot. These shells are thrown upon the shores of Europe and America by storms, and as they are liable to be driven upon our coasts (they have been found on Nantucket) I include them among Rhode Island shells.

The Gasteropods have well developed heads, with eyes and tentacles. The lower part of the body is thickened into an expanded, creeping disc, called the foot, by which they crawl along, dragging the shell after them, to which they are attached by the mantle. They cannot leave, or come wholly out of their shells, and as they grow, they enlarge the shell by secreting carbonate of lime from the food on which they live, and adding layer after layer of this material, as their increasing size demands more room.

I will explain here the meaning and application of some of the terms to be used in the descriptions of the Gasteropods in these papers, by using for an example a common fluviatite shell, *Vivipara contecta*. When first hatched from the eggs, these animals are provided with a shell about one-fourth of an inch in length, which grows quite rapidly by the addition of calcareous matter, as described above. The point where the shell commences to grow is called the *apex;* this, in some species, is decollated, or cut off when the animal arrives at maturity. The animal retires from the extreme end, into the body portion of the shell, and having no further use for the apex, and not being strengthened and protected by the presence of the animal within, it falls off. In some situations, carbonic acid in the water dissolves off the thin point, and in others it is eaten off by other carnivorous mollusca; in these cases the shells are said to be *eroded*. The shells of these Gasteropods are built in a spiral form, and coiled around an *axis*, which is in the centre of the shell, running from the apex to the opposite end, called the *base*. Each turn of the shell around its apex constitutes a *whorl;* each whorl as it recedes from the apex being larger in circumference than the preceding one. The line, or groove, formed by the junction of the whorls, is called a *suture*. At the end of the last turn, or *body whorl*, as it is termed, is the *aperture* or mouth of the shell. This aperture, in some species, is wholly are partially closed (when the animal has retired into the shell) by a horny substance (unlike the material composing the shell) which is attached to the foot of the animal and drawn in after it, forming a sort of door; this is called an *operculum*. From the top of the aperture to the apex, embracing all the whorls, is called the *spire*. The aperture in some families is entire; in others it is notched or produced into a canal. The margin of the aperture is the *peristome;* sometimes it is continuous; frequently it is interrupted; the left side of the aperture being formed by the body whorl. The right side of the aperture is called the *labrum* or outer lip; the left side, the *labium* or inner lip, also called the *columella*.

The base of a shell, at the axis, around which the whorls are coiled is sometimes open or hollow; this opening is called the *umbilicus;* and such shells are said to be *umbilicated*, or perforated. In other shells the umbilicus may be filled up by a calcareous deposit, or covered by the inner lip being expanded over it; such shells are *imperforate*. Lines of sculpture, or of color, running from the apex to the aperture are either *spiral* or *longitudinal;* other lines crossing the whorls are *transverse* lines, like the lines of growth. Most shells, while the animals inhabit them, are covered with an *epidermis*, more or less thick, composed of animal matter, similar to the cuticle, or scarf skin upon our bodies, to protect the shell from the action of acids, gases, etc., in the air or water in which they live. After the animal dies, and the shell is exposed to the sun and rain, the epidermis peels off, leaving the shell bleached in appearance and not desirable for cabinet specimens.

The Class Gasteropoda are separated for convenience into three great sub-classes: Prosobranchiata, Opisthobranchiata, and Pulmonifera, the characteristics of which will be described in their proper places.

(To be continued.)

CATLINITE.

The beautiful red stone pipes in collections of Indian culture-objects are made of a stone called catlinite. Mr. E. A. Barber tells us that for many generations the aborigines have procured this material from the great red pipe-stone quarry, situated on the dividing ridge between the Minnesota and Missouri rivers, at a place called by the French, Couteau des Prairies. Catlin, the celebrated traveler, was the first white man permitted by the Indians to visit the place, and therefore Dr. C. T. Jackson, to whom specimens were sent, named the mineral catlinite. The myths relating to the quarry, as well as surface indications, show that the place has been worked for a very long time.

In 1673 Marquette smoked in peace a catlinite pipe with the Indians of the upper Mississippi. Father Hennepin applies the term "calumet" to these ceremonial pipes.

There is no doubt that an extensive traffic was carried on in this material for a considerable length of time by the aboriginal tribes, extending from the Atlantic coast to the Rocky Mountain system, and from New York and Minnesota on the north to the Gulf of Mexico. The fact that objects of catlinite have been taken from Indian graves in the State of New York; and that others were found on the ancient site of an abandoned village in Georgia, at opposite points twelve hundred miles distant from the pipe-stone quarry of Minnesota, reveals the great extent of intercommunication which formerly existed among the North American peoples.—*American Naturalist, July.* —*J. W. P.*

CONCHOLOGICAL CHECK-LIST. III.

J. RITCHIE, JR.

Family. Cyclostomacea Pfr.
Sub-family. Cyclotea Pfr.
Cyclotus amboinensis Pfr.
asperulus Sow.
batchianensis Pfr.
bogotensis Pfr.
campanulatus Martens.
cingulatus Sow.
conoideus Pfr.
corniculum Mouss.
corrugatus Sow.
crassus C. B. Adams.
crosseanus Hidalg.
diatretus Gould.
discoideus Sow.
disjunctus Moric.
distinctus Sow.
dubiosus C. B. Adams.
duffianus C. B. Adams.
dysoni Pfr.
exiguus Sow.
filocinctus Benson.
fortunei Pfr.
fulminulatus Martens.
giganteus Gray.
glaucostomus Pfr.
granulosus Pfr.
guttatus Pfr.
hebraicus Less.
inca D'Orb.
incomptus Sow.
jamaicensis Chem.
jugosus C. B. Adams.
junquensis Pfr.
laxatus Sow.
lineatus Gray.
liratulus Martens.
macgillivrayi Pfr.
metcalfi Issel.
minutus H. Adams.
mucronatus Sow.
opalinus Mouss.
orbellus Lam.
pallescens C. B. Adams.
parvulus Martens.
perdistinctus Gund.
perezi Hidalg.
perpallidus C. B. Adams.
planorbulus Lam.
plebeius Sow.
popayanus Lea.
Cyclotus prominulus Fer.
pusillus Sow.
quitensis Pfr.
recluzianus Pfr.
scalaris Pfr.
schrammi Shut.
seminudus C. B. Adams.
semistriatus Sow.
stramineus Reeve.
subdiscoideus Sow.
subflammulatus Pfr.
subrugosus Sow.
substriatus Sow.
succinctus Martens.
saturalis Sow.
translucidus Sow.
varians C. B. Adams.
variegatus Swains.
vulvoides Sow.
Bucleya martinezi Hidalg.
Cyathopoma bicarmatum Bedd.
blanfordianum H. Adams.
ceylonicum Bedd.
coonoorense Blanf.
decanense Blanf.
elatum Bedd.
garoense G-Austen.
hirsutum Bedd.
jawaiense G-Austen.
kalryenense W. T. and H. T. Blanf.
kolamulliense Blanf.
latilabre Bedd.
limbiferum Blanf.
malabaricum Blanf.
procerum Blanf.
shevaroyanum Bedd.
sivagherrianum Bedd.
trochlea Benson.
vitreum Bedd.
Opisthoporus biciliatus Mouss.
birostris Pfr.
euryomphalus Pfr.
penangensis Stol.
rostellatus Pfr.
solutus Stol.
tubuliferus Pfr.
Rhiostoma hainesii Pfr.
haughtoni Benson.
housei Haines.
simplicilabris Pfr.

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Robin	$ .03	Pigeon Guillemot	$ .50	Blue Bird	$ .05
Cat Bird	.03	Mocking Bird	.10	Black cap Chickadee	.12
House Wren	.08	Brown Thrush	.05	Yellow Warbler	.05
Western House Wren	.11	Long-billed Marsh Wren	.09	Red-eyed Vireo	.10
Bell's Vireo	.18	Yellow-breasted Chat	.12	Cedar Bird	.10
Cliff Swallow	.05	White-rumped Shrike	.15	American Goldfinch	.07
Barn Swallow	.03	Purple Finch	.15	Grass Finch	.05
White-bellied Swallow	.08	Crimson House Finch	.08	Lark Finch	.18
Field Sparrow	.05	English Sparrow	.03	California Brown Tohee	.15
Chipping Sparrow	.04	Song Sparrow	.04	Black-headed Grosbeak	.20
Nonpareil	.17	Cardinal Grosbeak	.13	Red-wing Blackbird	.03
Red and black-shouldered Black Bird	.08	Cow Bird	.03	Brewer's Blackbird	.08
Meadow Lark	.12	Baltimore Oriole	.08	Boat-tailed Grackle	.15
Western Meadow Lark	.15	Purple Grackle	.05	Crow	.06
Blue Jay	.07	Scissor-tail Flycatcher	.20	King Bird	.04
Pewee	.05	Wood Pewee	.15	Flicker	.05
Red-shafted Flicker	.15	Chaparral Cock	.45	Screech Owl	.50
Sparrow Hawk	.30	Osprey	.35	Cooper's Hawk	.30
Red-shouldered Hawk	.40	Black Vulture	.85	Wild Turkey	1.00
Prairie Hen	.15	Bob-white	.10	California Quail	.19
Great Blue Heron	.30	Louisiana Heron	.20	Snowy Heron	.15
Night Heron	.10	Green Heron	.10	Little Blue Heron	.25
American Oystercatcher	.50	Killdeer Plover	.25	Wilson's Plover	.40
Bartram's Sandpiper	.40	Spotted Sandpiper	.10	Clapper Rail	.15
Coot	.15	Florida Gallinule	.15	Sora Rail	.15
Mallard	.25	Blue-winged Teal	.25	American Eider	.30
Brown Pelican	.20	Snake Bird	.30	Black Skimmer	.20
American Herring Gull	.20	Laughing Gull	.20	Gull-billed Tern	.25
Forster's Tern	.25	Common Tern	.10	Least Tern	.18
Thick-billed Grebe	.15	Black Guillemot	.22	Common Guillemot	.30
		California Guillemot	.35	Brunnich's Guillemot	.30

Sets of the above with data, for 2 cents per egg additional.

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Indigo Creeper	.40 to .50
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English Jay	1.00 to 1.25

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Amethyst, two kinds	.60 to .75
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Garnet-throat	.75 to 1.25
Ruby and Topaz	.50 to .75
Violet-eared	.45 to .60
Toucans, several kinds	2.50 to 3.00
Australian Parrakeets, several kinds	1.50 to 2.50
Impeyan Pheasant	12.00 to 16.00
English "	4.00 to 6.00
Japanese "	5.00 to 6.00
Peacock	12.00 to 13.50

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Per bag of 25 lbs........................ 2.50

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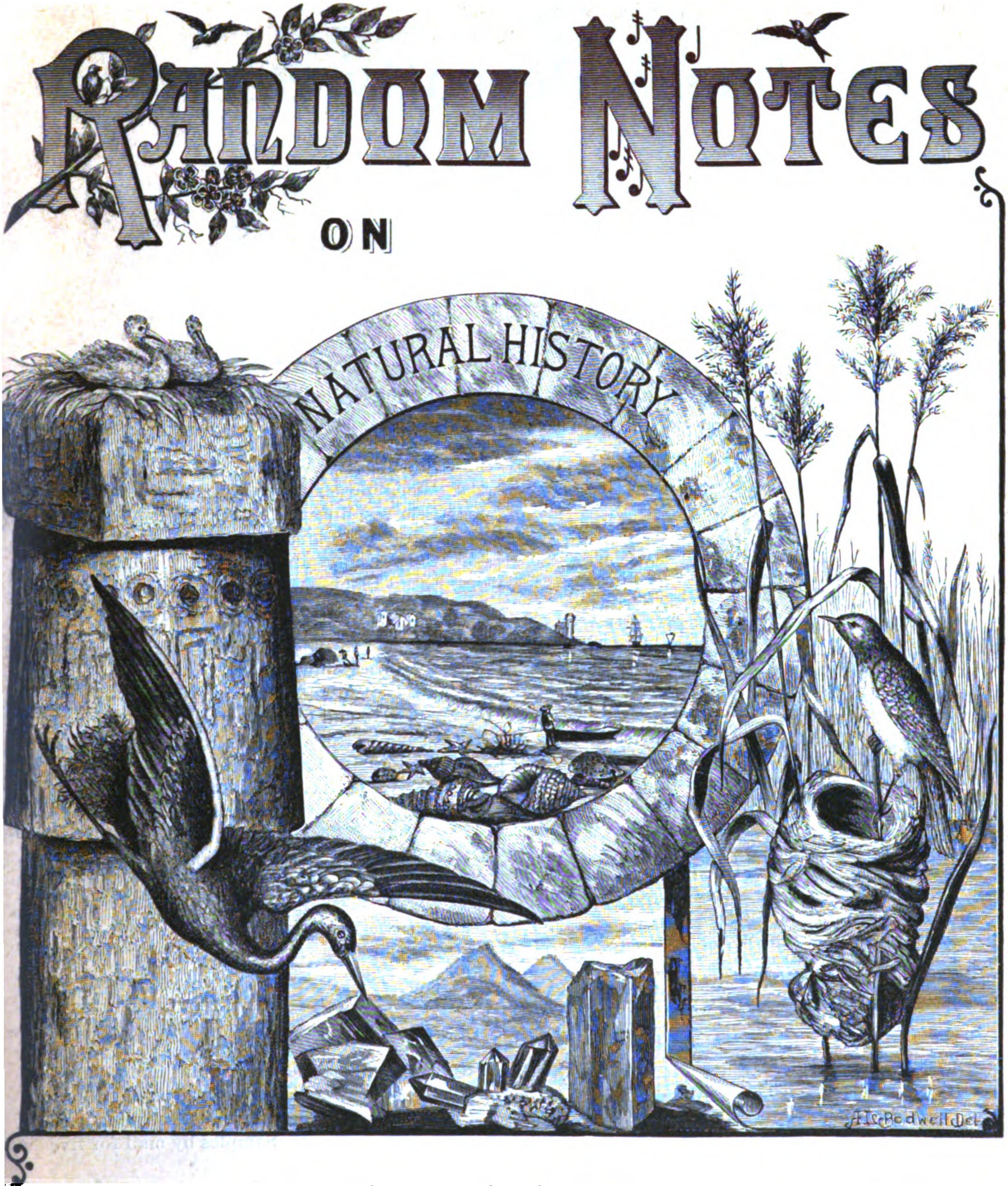

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Random Notes on Natural History.

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Random Notes on Natural History.

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The Toes of Birds.

This subject has just been forcibly brought to mind by having a Red-shouldered Hawk grasp my hand with his talons. He did not, however, succeed in hurting me, as I would not permit him to bend his leg, but kept it extended while I asked a man standing near to bend his heel joint backwards, which instantly released me. The *heel* joint is that at the top of the tarsus, and is frequently called the knee by those not well versed.

Many birds have not the power to open and shut their toes, unless the legs are in certain positions. This may be modified somewhat by saying they have not the advantage of the use of their full strength. For example: a hawk pounces upon his prey with legs extended and toes open, but he has not the power in his toes to close them tightly. Why? Because the toes of most of our hawks and owls are worked by leverage, the tendons passing over the heel. The hawk knows this, and no sooner does he strike his feet upon his prey then he bends his legs, thereby drawing his victim close to his body and burying his talons deep in its flesh. Without the reverse motion he is equally unable to release it.

The opening and shutting of a dead hawk's leg has doubtless been tried by every taxidermist, and probably not a few have had my own experience of being obliged to kill an owl to make it loose its hold of his fingers.

The osprey is notably a wise exception, for in the pursuit of his slippery prey he doubtless needs the free use of his toes.

Most, if not all, of our small land birds have this leverage, and it is this which enables them to sleep with no fear of letting go their hold.

Rhode Island Iron.

In our last issue we printed an article upon the peculiar features of the Porphyrytic Iron ore of Rhode Island, situated in Cumberland near the Manville station. The statement that this ore could not be profitably worked seems to require modification. An article printed in the Providence *Journal* states: "Experts have recently been at work, whose report says of the various deposits of magnetic iron ore in this part of the United States, that at Cumberland Hill is the most extensive and valuable. About 1,000,000 tons above water level, while, as the deposit shows an indefinite extension in depth, the quantity of this ore may be said to be practically inexhaustible." Prof. R. H. Thurston, of the Stevens Institute, Hoboken, writes: "That portion of the mountain lying above the natural drainage, and which may be obtained by 'open working' or quarrying, and without expense for hoisting or pumping, would alone supply a smelting furnace of the largest capacity for a century. The quantity below the ground is incalculable."

Mr. J. B. Moorehead, of Philadelphia, states that it is one of the purest ores known, containing 35 or 40 per cent. of net iron, and is richer at the foot than the apex of the hill.

To quote Professor Thurston again, "The Cumberland ore is free from noxious elements, and though somewhat refractory, it will furnish a very strong iron, or a most excellent steel." With the development of the Sieman's Direct Process, a new and immediate use for this ore has arisen.

The Roseate Spoonbill in Florida Rookeries.

Part III.

On Monday, March 9, we made a second visit, and captured six more Spoonbills, and took their eggs. A third visit was made the 11th, but a great change had taken place, only two Spoonbills being seen, and we were unable to secure either, though we took their eggs. The rookery was quite deserted, only the birds having nests remaining, and but a small portion of these with eggs, the majority having young birds in them. The eight Spoonbills' nests found contained 3, 3, 3 and one young, 3, 4, 4, 5, and 2 and one young. The young birds were covered with down, which we think was of a light pink color, but this tint has now disappeared.

The set of five eggs was a difficult one to obtain, the nest being placed about fifteen feet from the perpendicular of the base of the tree, and twelve feet high. The limb was not strong enough to climb out upon, and neither could it be pressed down within reach of my companion, without the eggs sliding off. But he was equal to the emergency, and after leaving me at the base of the tree, he placed the centre of the boat beneath the nest, and putting his pole against the limb, held it up while I climbed out and gathered the contents. The two birds were standing side by side on a limb, and were both obtained at one shot. They were both very high plumaged. The eggs of the Spoonbill are about the size and shape of Wild Turkeys'. The shell is white and marked with bran-colored spots. The set of five is probably the largest known, and the eggs are otherwise good representatives of the species. Mr. Snowdon Howland, in whose possession it is, gives the measurements as follows: 2.56x1.76, 2.54 x1.71, 2.53x1.79, 2.49x1.79, and 2.43x1.83. One pure white egg was taken from a bird, and at the next rookery visited, an immaculate one was taken from a nest that had a spotted one for a companion. Audubon describes the eggs as white, and if his observations were limited to the finding of a single nest with perhaps but an egg or two, they may have been so, and if sparingly spotted, like one or two others obtained, he may have thought it some foreign substance or stain. But seven out of eight are strongly marked.

The nests of Spoonbills, Herons, and Snakebirds are all made nearly alike, and when a rookery is in a progressive state, the sticks with which to build are in such demand, that no sooner is a nest emptied than the sticks are appropriated by the other birds, just building. As soon as the Spoonbills disappeared we turned our attention to the other birds. We took three or four nests of the Great Blue Heron, or its Florida representative. The eggs were either three or four in number, and varied from fresh to nearly hatched. The Snakebirds laid from three to five, and there were fresh eggs and young birds in all stages to two-thirds grown. The same condition applies to the American Egret, except the number was never more than three, and while the other birds all nested closely about the pond, giving their preference to the small trees and bushes, this species preferred the cypresses, and sometimes built at considerable height, though their nests did not extend far into the swamp. The Snowy and Louisiana Herons usually laid four for a complement, and incubation was not far advanced in either. The eggs of these two species are easily distinguished, the latter being much the darker, though after considerable exposure to light they will intergrade. The White Ibis and Little Blue Herons had not begun nesting, and the Reddish Egret and White-crowned Night Heron were not observed in any of the rookeries. We found a very few Black-crowned Night Herons, and took one nest.

In a colony of this kind, all of the species have habits alike in one particular, viz.: Both birds incubate, as one must stay by the nest always. A horde of Fish Crows is always hovering around to seize upon and bear away any eggs left for a moment unprotected, and the shells are to be found at distances quite far removed. The ever-watchful alligators in the water beneath are always on the alert to seize upon any unlucky young one that may be precipitated from the nest. When these monsters close their jaws upon their prey, the sound may be heard a distance of several hundred yards.

One day, as we were returning from the farther side of the rookery, we killed a Snake Bird, and immediately a Wood Ibis flew from the foot of a large tree. A charge from the second barrel dropped it into the pond, wing-broken. But scarcely had it touched than an alligator arose and began a hot pursuit, which was fully realized by the wounded bird. Meantime we were poling and reloading as rapidly as possible, but scarcely was one cartridge in than the 'gator was about to seize his prey, and a shot behind the eye set him to thrashing in the agonies of death; but another moment and the Ibis would be ashore, when it could quickly run out of range; but just as it was gaining its feet, another shot laid *it* low also.

One afternoon we visited the rookery, taking our blankets with us, so we could stay until dark and see what birds came in to roost, and then sleep in the nearest hammock. We were disappointed at not seeing any Spoonbills, but pleased that we had a chance to see the White Ibis come in to roost. They came in long rows, with a loud rustle of wings, and gathered on three or four trees. After several flocks had alighted and standing room was getting scarce, another flock swung in and a general flapping and dislodgment took place, and then, as if by common consent, away they all went, forming themselves into three or four ranks as they flew. After going a distance of perhaps a quarter of a mile they wheeled, and back they came with a rush and alighted upon the same trees from which they started, only perhaps occupying another tree also. The next arrival caused another commotion and another general flight, and several times this was repeated. The White Ibis is a beautiful bird in life, though strange looking, with its blood-red face and blue eyes. Its whole plumage is of cleanest white, with the exception of the blue-black tips to its wings, a very noticeable character when flying.

On one occasion when shooting American Egrets a pair of Pileated Woodpeckers began work scarce twenty feet above our heads, and seemed not in the least concerned, although we fired about two dozen shots at the Herons. These Woodpeckers were the least shy of any birds I ever met, and it is the more remarkable on account of their usual extreme wariness. The flesh of the Spoonbill is excellent eating, as we had abundant chance to determine, for it was only by close calculating that we were not starved out before our team came for us.

(To be continued.)

A few Points about Loading a Gun. — This topic does not naturally fall within the scope of taxidermy, though it does practically, and is to most young collectors a source of trouble. The principle of loading correctly is the same as that used in choosing a stone to throw. There is a certain weight that can be thrown a greater distance than one either lighter or heavier. The common fault is to load too heavy. If too much powder is used it cannot all burn before leaving the barrel, thus being a waste if nothing more. If too much shot is used it will not be propelled so far, besides giving the sensation known as a kick, which is nothing more nor less than the gun moving back to free itself of the charge. There is, of course, always a recoil, but this should be so slight that the shoulder can withstand it without flinching. If the recoil is allowed there is no doubt but the force of the charge is much impaired. This will account for a gun shooting so much harder when held by some persons, than by others.

A *foul* gun will shoot much harder than a *clean* one. If you doubt this, fire at a pamphlet with a clean gun and observe the penetration, then after shooting a few times try it again. The reason is obvious; when the gun is clean the shot leave the barrel with the burning of the first of the powder, but when the barrel is not shiny, the friction retards it to get the full benefit of the powder. If you use a cheap quality, it is almost a necessity to clean your gun daily; but if you use good powder it will not perhaps need cleaning oftener than once in several weeks, and this is no injury to the gun either. We have for several seasons past used Hazard's Duck Shooting Gunpowder, No. 3 grain, for collecting, and think it superior to any other.

Several years' experience have given us the following results as being the best for a 12-bore breech-loader. Never use over 3 drams of powder or 1 ounce of shot. This is the strongest load for all sizes of shot to No. 10. There is more friction, and consequently more kick, to a charge of small shot, so that 2½ drams of powder is sufficient for one ounce of 10^{s}, 11^{s}, or 12^{s}. We use dust-shot very largely, and find it very effective. The heaviest charge we load of this size is ¾ oz. to 2½ drams of powder, and for short distances of 20 yards and under, ½ oz shot and 1¾ drams of powder.

Use good felt wads, one over the powder, and another over the shot in all light charges, but the sizes of shot larger than 10^s should have 2 wads over the powder. If the ends of the shells are turned down with a crimper, it will save the loss of many a charge of shot. The light charges should have the top wad gummed in, by passing a mucilage brush around on top of the wad. Paper shells are much cheaper than brass in the long or short run. If you can make the brass shells figure the cheapest in actual dollars and cents, then figure the convenience of not having to stop to load when weary after a long day's work. Buy several hundred paper shells of good quality and load them before the season commences. Then each day bring back your empty shells and fill your pockets with loaded ones, and after the season is passed recap and reload, buy what extra you need, and you are ready for the next year. The collector who does not manage in this way, does not know what a comfort he misses.

The chief objection to paper shells is, that if even slightly wet they swell so they cannot be put into the gun. This objection is easily overcome by unwinding the outer layers of paper until the cartridge is reduced to the required size.

Action of the Electric Light.

A European journal relates that a few months since workmen employed upon some constructions on the bank of the River Dnieper, in Central Russia, employed the electric light to enable them to prosecute their labors at night. The brilliant rays of light attracted so many millions of nocturnal moths, beetles, and other insects, that from time to time it was necessary to stop work and set all hands to destroying the clouds of winged victims that frequently obscured the light. This suggested the idea of employing the electric light to destroy nocturnal insects prejudicial to agriculture, and experiments in that direction are to be tried this spring. Not only to insects, but to fish, the light proved fatally attractive. Its rays, directed to the surface of the water, drew together vast quantities of all the fishes found in the Dnieper, and when within the charmed field of illumination, they lay crowded together in masses, seemingly blinded and stupefied. The workmen, improving the opportunity, made a notable haul of fish.

We cannot record any such remarkable effects, but we were surprised and gratified by obtaining from the globes on our principal business street, during the collecting months of 1883, quantities of moths, *i. e.*, cæcropia, polyphemus, imperialis. luna, io D. rubicunda, and a host of small species, as well as many beetles. The principal objection to this kind of collection was, that very many specimens were burned and torn so badly as to be useful only for study, and of no cabinet value. However, as a means of discovering the different species frequenting the neighborhood (and perhaps for a mile or so away), these lights are invaluable.

Apropos of the effect of the light upon fish, we note that the United States fish-commission steamer "Albatross" has been fitted up with electric lighting, to enable the naturalists to labor at night, examine the contents of the dredge, and note with greater precision the reports of their laboratory apparatus.

From articles in *Science* of Nov. 16th, 23d, and 30th, 1883, from page 706, we quote: "That it is a common thing for flying-fish to come on board ship at night if a light be advantageously placed to attract them.

"Until incandescent lamps were invented, there were no convenient means of sustaining a light beneath the surface of the waters; and there is consequently opened up to us an unexplored field in fishing.

"Just what service our submarine lamps will be, we are unable to say; but, with the small lamp which we used from one to ten feet below the surface, amphipods in great numbers, silver-sides, young blue-fish, young lobster, squid, and flying-fish, have been induced into the nets, and dolphins have approached it, but whether attracted by the light or in pursuit of the squid, Professor Benedict, the naturalist of the ship, was unable to say. Squid are especially susceptible to the influence of light. I am informed by Professor Verrill, of Yale College, that a heavy sea, breaking upon a lee shore when the full moon is casting its rays across the land into the sea, will throw hundreds of squid upon the beach in a single night,— an evidence of their moving in the direction of the light until caught in the spray and hurled to the shore."

THE RHODE ISLAND ENTOMOLOGICAL SOCIETY

have held their regular meetings. At the last session Mr. Wm. Smith exhibited ten species of small moths, taken at night near Providence, about April 10th, by means of a lure.

Mr. S. Schofield read a paper before the Society relative to some experiments he has made with the eggs and larvæ of *Ceratocampa imperialis*. Fifty or sixty eggs had been obtained from a moth so injured by the electric lamp as to be worthless as a cabinet specimen. The fluid contents of the egg impart to it a bright amber-yellow color, the shell, unlike that of the egg of the silk-producing moths, *e. g.*, the *cecropia*, being transparent. As the larva becomes developed it can be seen coiled up within the shell, which it proceeds to perforate when fully developed, making an aperture sufficiently large to allow the passage of the head, the largest portion of the larva. After its exit, in many cases the larva continued to eat the shell, obeying, the reader thought, a similar instinct to that which prompts the larvæ of other moths to eat their discarded skins after moulting.

At first the horns of the *imperialis* larvæ are soft and feebly developed, but rapidly become elongated and strengthened, at the same time changing markedly in color.

The reader described very graphically a few proofs of the belligerent propensities shown by the larvæ while under observation, and instanced the apparent possession of considerable thinking power. Unlike other larvæ, which blindly strike from side to side when disturbed, the *imperialis* uses its horns in a manner calculated to do the greatest harm to its adversary. As the larvæ grew older, they grew wiser as well, and in their battles one would with his mandibles seize his opponent at about the middle of the body, and holding him for a moment suspended over the edge of the leaf, dash him spitefully to the table below. The reader questioned if such encounters in nature might not explain the scarcity and isolation of the *imperialis* larva. One thrown to the ground from a tree, if surviving its injuries, would probably perish from being deprived of its food.

Many larvæ, especially when young, deposit a silken thread as they travel. The *imperialis* does this, and after biting into the edge of a leaf, usually at its base, the larva always returns to this spot to feed, guided by the silken thread. Always before feeding on a fresh leaf a fine network of silk was first woven over the point of attack, and to this the silken trail was attached.

The reader in conclusion quoted from Alfred Wailly's Report in the *Journal of the Society of Arts*, a description of the *Ceratocampa imperialis* in its different stages, and called attention to the possibility of the larvæ being not only carnivorous but also cannibalistic, when crowded. The larvæ seemed to thrive best on the oak or willow, though in nature they feed on the buttonwood.

The paper was rendered particularly interesting by the introduction of several large drawings during the reading, notably of the larva coiled up within the egg, and seen through the transparent shell, and also representations of various battle-fields.

H. T.

THE LONSDALE BOTANICAL AND FIELD NATURALIST SOCIETY

held their regular meetings March 17th and April 14th.

Beside other matters of interest, the Vice-President, Mr. James Moss, read a paper on "Local Trees," describing about fourteen species, the localities where they are found, and the practical use of various kinds of timber; he also named many botanical specimens. Among them some *Epigœa repens* in full bloom, and taking up a piece of smilax (*Myrsiphyllum*), he pointed out the difference in position between stems and leaves, and how easily one may, without close observation, be deceived by them.

In connection with the report of the Lonsdale Botanical and Field Naturalist Society, we would add that the *Myrsiphyllum*, or smilax of green-houses, gives an excellent illustration of abortion; the leaves being only represented by small bract-like organs, in the axils of which are the broadly expanded and highly specialized stems, performing the function of true leaves.

This plant also illustrates the confusion arising from the use of names given by those unfamiliar with the nature of plants. Thus, the smilax of the city is entirely different from the smilax of the woods, *Smilax rotundi folia*, commonly known as greenbrier, and *Smilax herbacea*, or the carrion-flower, the abominable odor of which attracts carrion insects which undoubtedly assist in its fertilization.

The accompanying verses, applicable to the cultivated smilax, appeared in the Providence *Journal* some time since:

The Spirit of Modern Science.

A lady not fond of monotony
Decides that she'll master Botany;
So, taking a leaf,
To her glee and her grief,
She finds that she really has *not any*.

For her teacher with subtle analysis
(Where an innocent savor of malice is),
Says, "Madam, ahem!
This leaf is a stem,
And science must banish our fallacies."

A NEW BIRD FOR RHODE ISLAND, AND THE SECOND FOR NEW ENGLAND.—A Prothonotary Warbler was killed in South Kingstown, R. I., April 21, 1884, by Mr. R. G. Hazard 2d. The specimen is a highly colored ♂. The only other recorded for New England was taken in Maine, in October. The latter bird was doubtless a straggler, but the former, appearing as it does at this season, leads to the conclusion that it may occur regularly, but sparingly. The nature of its haunts, the worst possible swamps, allows of this suggestion. Furthermore, the song being lisping and the bird very restless, enables it to better escape detection.

A NONPAREIL *Passerina ciris* IN RHODE ISLAND. — Mr. Daniel Seamans reports shooting a Nonpareil in Scituate, R. I., during the summer of 1882, but as he was just about leaving home, he could not preserve it. Mr. Seamans also mounted a RICHARDSON'S OWL during the following winter. It also was shot in Scituate, R. I.

EARLY WOODCOCK.— Mr. R. G. Hazard, 2d, found a Woodcock's nest, April 16th, that the young had just left, and he collected the shells.

"MR. Cobb recently married Miss Webb. He knew she was meant for him, the first time he spied her."

Callidryas Eubule in Rhode Island.

THE first and only occasion upon which I have met with this insect on the wing in this region, was when I was collecting lepidoptera some fourteen or fifteen years ago.

It must have been sometime during the summer of 1869 or 1870, as I was walking along the road which runs between the hotel and the rocky shore at Narragansett Pier, that I noticed among the numerous specimens of *Colias philoidiee* which were flitting hither and thither in their usual profusion, one insect in particular which attracted my attention by its superior size and clear yellow coloring. If I remember rightly I was without my net, and it required a long and tedious chase to secure the unknown visitor.

In those days my knowledge of lepidoptera was chiefly confined to what I had learned from "Harris," and did not extend much beyond the common species to be met with in New England. I was therefore considerably puzzled and excited over my strange capture, which had hardly been secured, before, to my further surprise, several others appeared upon the scene.

I ran to the house for my net, and the pursuit of the butterflies now began in good earnest. They led me along the shore road toward the North Pier, and thence to a rough, marshy meadow, back of the beach, and here I truly had glorious sport. The Eubule were swarming about the brilliant cardinal flowers which grew in abundance, and their numbers were constantly augmented by new arrivals, which all appeared to come from the south. Most of the specimens were considerably mutilated, and appeared to have been on the wing for a considerable time. I obtained, however, some two dozen fair specimens, and some nearly perfect. They were common about the place for several days, and then gradually disappeared.

As I have never met with this insect alive, either before or since, and have never heard that it was indigenous to any localities in New England, I presume that this swarm of travel-worn insects, appearing suddenly as they did, must have come from their native climes a considerable distance south.

HOWARD L. CLARK.

The Shell-Bearing Mollusca of Rhode Island.

[BY HORACE F. CARPENTER.]

CHAPTER V.

SUB–CLASS. 1. PROSOBRANCHIATA.

Mostly marine mollusks, although a few species inhabit brackish water, some others live in fresh water only, and still others upon the land. The animals are provided with a shell, and generally with an operculum. (*All* the operculated mollusca belong in this sub-class.) They breath by gills or branchiæ. The sexes are separate in this group, while in the other sub-classes they are united in each individual.

The Prosobranchiates are divided into four orders, Pectinibranchiata, Scutibranchiata, Polyplacophora, and Nucleobranchiata.

ORDER 1. PECTINIBRANCHIATA.

Animal, with pectiniform branchiæ; that is, composed of leaflets arranged like the teeth of a comb, in one or two series or lines, situated upon the upper wall of a respiratory cavity formed by the mantle, having an external opening upon the side of the neck. Shell spiral.

This order contains forty-six families. As these papers are not intended for a complete classification of the mollusca, but only for those inhabiting Rhode Island, it is not necessary to name them all, excepting as they apply to the subject in hand.

FAMILY 1. MURICIDÆ.

Shell spiral, fusiform; aperture more or less canaliculate, or simply notched in front; whorls thickened by varices or nodules at each rest period of growth. Operculum with subapical or lateral and marginal nucleus. This family is divided into two sub-families.

1. Muricinæ. Three or more varices on each whorl, the varices being nodulous, foliated, or spinose; canal long or short, but well marked. Operculum ovate.

2. Purpurinæ. Without varices, but tuberculate; columella flattened; canal very short, or often a mere notch. Operculum, oblong.

SUB–FAMILY MURICINÆ.

Muricinæ contains five genera; Murex (divided into eight sub-genera), Urosalpinx, Eupleura, Typhis, and Trophon. Two of these genera, Urosalpinx and Eupleura, are represented in Rhode Island.

GENUS UROSALPINX, STIMPSON. 1865.

Syns:
Adamsia, Dunker. Agnewia, T. Woods.

Fusiform; no proper varices, which are replaced by longitudinal ribs.

Distribution. Twenty species, one of which inhabits Rhode Island.

2. UROSALPINX CINERA, SAY. 1821.

Syns:
Fusus cinereus, Say. DeKay. Philippi.
Buccinum plicosum, Gould. Menke. 1830.
Buccinum cinereum, W. G. Binney. 1870.
Rapana cinera, Stimpson.
Urosalpinx cinera, Stm. Dall. Tryon, etc.

Shell elongated-oval, tapering at both ends, coarse, solid, of a reddish brown color, covered with an ashy gray epidermis; whorls five, crossed by ten to twelve robust costæ, and reticulated by numerous filiform, revolving lines, crenating the edge of the outer lip, which is sharp; aperture ovate, colored within from light flesh color to dark salmon, sometimes chocolate or purple; inner lip arched and enameled; beak short and slightly curved; shell operculate and slightly umbilicate. Length, one inch; breadth three-fifths. These shells inhabit the Atlantic coasts of the United States, from Maine to Florida. They are second only in abundance to Ilyanassa obsoleta in Rhode Island, and are found in our bay everywhere below Fox Point, on rocks between tides.

The females lay their eggs in June in small transparent membranous parchment-like vases, attached to the under side of some overhanging rock, just above low water mark. The vases are attached in rows, covering an area of three or four square inches. Each female deposits from ten to more than one hundred of these vases, the process of laying occupying several weeks.

GENUS EUPLEURA, H. AND A. ADAMS.

Ranelliform, with a pair of lateral varices, one on each side, with intermediate smaller varices; aperture dentate within.

Dist. 5 species, one of which inhabits Rhode Island.

3. EUPLEURA CAUDATA, SAY. 1822.
Syns.:
Ranella caudata, Say. Gould. Adams. DeKay. Stimp.
Triton caudata, Keiner.
Eupleura caudata, H. and A. Adams. Stimp. Dall. Perkins.

Shell rhomboidal, solid, brown; whorls five, crossed by eleven elevated ribs, the one on the left side of the body whorl, and the one bordering the aperture, are enlarged into strong, wing-like varices; these ribs are crossed by fine equidistant lines, revolving with the whorls; aperture inversely ovate, rounded behind and pointed before; outer lip thick, margined within with thick granules alternating with the exterior lines; inner lip smooth, flattened, and, like the interior of the mouth, is bluish white; canal coarctate, as long as the spire. Length one inch, breadth half an inch. It was first described by Say, *Journal Academy Natural Science*, Vol. II., p. 236.

It inhabits the Atlantic coast, from Cape Cod to Georgia. It is quite common South, but rare in Rhode Island. Its habitat is in the laminarian zone, but is sometimes found between tide marks. I have found about a dozen specimens in as many years, in Coweset Bay, below Apponaug.

SUB-FAMILY PURPURINÆ.

Purpurinæ contains twenty-one genera, one of which, Purpura, inhabits Rhode Island.

GENUS PURPURA, BRUGUIERE. 1789.
Syns.:
Mancinella, Link. Microstoma, Swainson. Thais, Link.

Shell oblong-oval, body whorl large; spire generally short; aperture ovate, large, terminating in a very short, oblique channel, or notched; columella flattened; outer lip simple. Animal carnivorous.

Dist. 57 species. Fossil, 40 species. All parts of the world, low water to twenty-five fathoms. The genus Purpura is divided into ten sub-genera, one of which, Polytropa, is native to our shores.

SUB-GENUS POLYTROPA, SWAINSON.

Spire acuminate, whorls foliated or tuberculose; inner lip flattened; canal small, oblique; aperture narrowed at the front. This sub-genus contains several species, only one of which inhabits Rhode Island. This species, lapillus, will be described in the next chapter.

(To be continued.)

A Remarkable Sassafras Tree.

THERE is now standing upon the "Spring Brook," or "Larkin" farm, in Cranston, R. I., a sassafras tree worthy of note. My first visit to it was in company with Mr. George Hunt, in May, 1872. It is located in an open, cultivated field of several acres, and seems to have been spared on account of its size and beauty. A careful measurement, at the above date, gave the following results: Circumference of trunk, near the ground, 14 ft., 3 in.; 2 ft. up, 11 ft., 10½ in., — holding its size from this point with little diminution to the first limbs, 11 ft. up. The height of the tree, computed from its shadow, was 49½ ft. Measurements taken ten years from the first date, show only an inch or two increase in girth. Since I have known the tree it has had but few limbs and these irregularly scattered. But with all its evidence of great age it is still vigorous, and may keep its life for a decade or two more. If there is a larger tree of this kind in New England it would please the writer to learn where it is.

Near by this tree, in a pasture lot adjoining, is a noticeable colony of trees of the same kind. They number above fifty, and are irregularly ranged in a row by the side of a wall. They average about 30 feet in height and are 6 to 8 inches in diameter, 2 feet up. They are probably progeny of the patriarch tree in the lot, and, taken with it, form an interesting family group. It may be proper to add that there are several fine oaks, chestnuts, and elms near this locality.

L. W. RUSSELL.

Cement for Mending Shells.

GUM Arabic, ten parts; sugar candy four parts. For large and heavy shells: Resin, eight parts; bees-wax, two parts; plaster of Paris, ten parts by weight. Melt all together. Slightly warm the fractured edges of the specimen, and apply the cement. The cement must always be heated a very little before using.

All superfluous cement may be scraped off when hardened.

AMBER.

Amber, like coal, is a mineral of organic origin, but, unlike the latter, it has undergone no serious change through its long entombment, and by its resurrection comes forth in all its original brilliancy and purity. Amber is the product of some early species of coniferous tree long since extinct. As the turpentine that exudes from the pine-tree of the present leaves, upon evaporation, a semi-transparent resin, so the sap that trickled from the limbs of those ancient pines left behind a resin, that has long survived the tree in which it was produced. These two resins closely resemble each other, and the modern product is often sold under the name of, and for the price of, the ancient resin, although inferior to it.

Most of the real amber used in the arts comes from the Prussian coast of the Baltic between Kōnigsberg and Memel. Considerable quantities are found entangled in the sea-weed that is washed ashore after a storm, but much larger quantities are obtained by dredging. In 1876 there were eighteen steam dredges and two tug boats, with about one thousand men, employed in this industry at Kurische Haff, which is about twelve miles south of Memel. Amber is also found in Roumania, where it is obtained by mining, and forms quite an important industry. More highly prized than either of these is a variety of amber that comes from Sicily.

Amber is sometimes found in other parts of Europe, also in this country, especially in New Jersey and Maryland, but it is inferior to the varieties above mentioned.

Baltic amber is of a pale yellow color, not unlike pale ale (amber ale), but Roumanian amber is frequently red or brownish, sometimes blue, green, and even black.

It is a little heavier than water, the specific gravity varying from 1.065 to 1.080. It does not, of course, dissolve in water, and alcohol extracts but a small portion of it, including the coloring matter. It dissolves completely in strong sulphuric acid, and the solution has a reddish purple color. It is also soluble in alkalies, as other resins are. It seems to bear a peculiar relation to camphor, for on extracting the portion soluble in ether the residue has the same percentage composition as camphor ($C_{10}H_{16}O$); and when it is distilled with potassic hydrate, a substance passes over having all the properties of camphor. Nitric acid is said to convert it into artificial musk.

Baltic amber is rarely found in large pieces, and hence its price, like that of the diamond, increases very rapidly with the size. A piece in the Berlin Mineralogical Museum weighs eighteen pounds, and is valued at $30,000. Amber that contains insects is more valuable, other things being equal, than the clear pieces. No less than eight hundred species of these extinct insects have been found imbedded in amber.

Masses of amber of considerable size have been found in New Jersey, in the green sand and the ash marl just above it. American amber differs in several respects from Baltic amber, being lighter than water and fusing to a mobile liquid, while Baltic amber fuses to a thick, sluggish liquid. It burns easily with a strong, smoky flame, is soluble in chloroform, carbon disulphide, and oil of turpentine, is but slightly acted upon by nitric acid, and forms a red solution with sulphuric acid.

Amber is often imitated by colophony (rosin), the manufacturers even going so far as to introduce insects into it, but the naturalist would find no difficulty in distinguishing the modern from the extinct insect. Other tests for artificial amber are as follows: natural amber melts at 545° to 550° F., while the artificial melts at a much lower temperature; and the former is but slightly and slowly acted on by alcohol, while the latter is immediately attacked, the surface becoming dull, and it gradually softens.—*Popular Science News.*

Camels.—A number of years ago a company imported some camels for transporting goods across the plains of Arizona. The enterprise proved unprofitable and the animals were turned loose to care for themselves. The barren country seemed to suit them as well as their native Asiatic home, and they have increased so that now there is said to be a herd of four hundred wild camels in the territory. It is further reported that an Australian has bought the herd for ten thousand dollars from the company which still claims the ownership, the purchaser to capture them, when he proposes to ship them to Australia, with the expectation that he can employ the animals at a profit.—*Newburyport Herald.*

CONCHOLOGICAL CHECK-LIST. V.

J. RITCHIE, JR.

Family. Cyclostomacea Pfr.
Sub-family. Cyclophorea Pfr.
Craspedopoma costatum Shutt.
hespericum Morl.
lucidum Lowe.
lyonnetianum Lowe.
monizianum Lowe.
Craspedotropis cuspidatus Blanf.
galatheæ Mörch.
wüllerstorfi Zeleb.
Aulopoma grande Pfr.
helicinum Chem.
iteri Guerin.
sphæroideum Dohrn.
Micraulax scaber Theob.
Cyclophorus acutimarginatus Sow.
affinis Theob.
alabastrum Pfr.
alternans Pfr.
altivagus Benson.
amboinensis Pfr.
amvenus Pfr.
anguis Hanl.
annulatus Troschel.
apiæ Recluz.
appendiculatus Pfr.
aquila Sow.
artensis Montrz.
atomus Morl.
atramentarius Sow.
aurantiacus Schum.
aurora Benson.
bairdi Pfr.
balteatus Benson.
bathyraphe Smith.
beanianus Petit.
beddomei Blanf.
bensoni Pfr.
bifasciatus Mouss.
bifrons.
biliratus Bedd.
birmanus Pfr.
bocageanus Gass.
borneensis Metcalfe.
boucardi Sallé.
bourcieri Pfr.
brevis Martyn.
calyx Benson.
canaliferus Sow.
cantori Benson.
cayennensis Shutt.
ceylanicus Pfr.
charpentieri Mouss.
clouthianus Möll.
Cyclophorus coeloconus Benson.
conulus Pfr.
convexiusculus Pfr.
convexus Blanf.
cornu-venatorium Sow.
couderti Fischer.
crocatus Born.
crosseanus Hidalg.
cryptomphalus Benson.
cumingi Sow.
cuspidatus Benson.
cuticosta Möll.
cybeus Benson.
cytorta Gray.
denselineatus Pfr.
deplanatus Pfr.
disculus Pfr.
enomphalus Pfr.
erythrostomus Mrts.
exaltatus Pfr.
eximius Mouss.
expansus Pfr.
exul Benson.
flammeus Pfr.
flavilabris Benson.
floridus Pfr.
foliaceus Chem.
forbesianus Pfr.
fornicatus Pfr.
fulguratus Pfr.
garreli Eyd. et Soule.
guimarasensis Sow.
guttatus Pfr.
halophilus Bens.
haughtoni Theob.
herklotsi Mrts.
hildebrandti Mrts.
himalayanus Pfr.
hispidulus Blanf.
ibyatensis Pfr.
ictericus Sow.
indicus Desh.
inglisianis Stol.
involvulus Müll.
jerdoni Benson.
khasiensis Nevill.
labiosus Pfr.
layardi H. Adams.
leai Tryon.
leporinus Blanf.
leucostomus Pfr.
linguiferus Sow.
lingulatus Sow.
loxostomus Pfr.

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No. of Eggs in Set Identity

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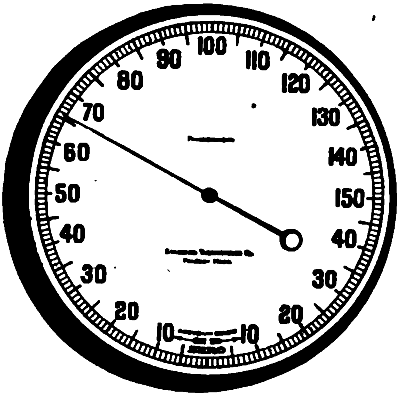

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Xipidogorgia citrina Esplr. Yellow sea plume....................		.75
Muricea elongata Lam...........		.60
Manicina areolata Ehr, Bahamas..	.20 to	.50
Dichocoenia porcata M. Edw', Bahamas......................	.75 to	1.25
Agaricia agaricites M. Edw', Bahamas......................	1.00 to	1.25
Mussa multilobata................	.30 to	1.50
Porcillopora meandrina..........	1.00 to	3.00
Fungia elegans Verrill, E. I.......	.25 to	.40
Fungia confertifolia Dana, E. I....	.50 to	1.00

ECHINODERMS, DRY SPECIMENS—URCHINS.

Hippona esculenta, A. Ag., Bahamas, without spines..........	$0.25 to	$0.50
Diadema setosum, Gray, Bahamas, without spines...............	.30 to	.50
Strongylocentrotus drobachiensis, A. Ag., Mass., with spines.....	.10 to	.25
Strongylocentrotus franciscanus, Cal., spines		1.00
Echinarachnius parma, Gray, Mass., with or without spines........		.10
Moira atropos, A. Ag., Fla., no spines........................	.10 to	.15
Echinanthus rosaceus, Gray, Bahamas, with spines, $1.25, without	.50 to	1.00
Metalia pectoralis, A. Ag., no spines		3.00
Meoma ventricosa, Lth., Bahamas, with spines.	3.00 to	4.00

STAR FISH.

Asterias Forbesii, Verrill, R. I....	.10 to	.40
Solaster endeca (10 rays), Grand Menan..............		.50
Oreaster gigas, Lath., Nassau, very large (15 in. diam.), no spines..	1.50 to	2.00

SHELLS.

Of the very rare Voluta Junonia we have lately received a few specimens, $10 to $15. They have usually been quoted at from $30 to $40.

MINERALS.

Water Geodes from Tampa, Fla., and from Uruguay. The enclosed fluid can be distinctly seen....	8.00 to	15.00
Beautiful clusters of Quartz Crystals, from Hot Springs, Ark., postage extra...	.25 to	2.00
Polished Crocidolite, fine specimens	.75 to	3.00
Osteolite, from Marseilles, France..	.25 to	1.00
Margarite, Chester, Mass..........	.10 to	1.25
Black Tourmaline, Pierpont, N. Y..	.25 to	4.00
Tremolite, Gouveneur, N. Y........	.75 to	2.00
Pyromorphite, Eng................	1.00 to	2.00

Also a lot of small specimens crystalized tin, (cassiterite), Cornwall, Eng., twenty-five cents, post-paid.

Random Notes on Natural History.

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Random Notes on Natural History.

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INFLUENCE OF SCIENTIFIC STUDIES.—While it must be conceded that force of expression and facility in the communication of thought are best to be acquired through the philosophical, dialectical, and rhetorical studies and exercises which in the main compose the curriculum of the older institutions of our country, I believe it to be equally true that the faculties of clear perception, of careful discrimination, and of just generalization, are developed by the study of natural history, of chemistry, of physics, as they can be through no other educational means.— *Gen. F. A. Walker.*

IT becomes our painful duty to announce to our readers the death of Edgar A. Small, of Hagerstown, Md. He died April 23d, in the twentieth year of his age, after a long and painful illness, which resisted the efforts of the most skillful physicians. Mr. Small was well known to many of our readers as an ardent ornithologist, oölogist, and artist, in all of which he excelled to a wonderful degree, considering his illness and limited opportunities. He was painstaking and cautious, and his every statement could be relied on, for it was to the best of his belief. In his correspondence to his most intimate friends he expressed a perfect resignation, and calmly awaited the time when he should pass to a better sphere.

The papers of his native town give rare tributes to his memory, which, had we the space, we should like to print at length, for few they are who suffer so much, are uncomplaining, accomplish so much, and make so many friends, as our young fellow ornithologist who has just gone from our midst.

PROTHONOTARY WARBLER.— Mr. R. G. Hazard writes the following regarding this bird, recorded by us in the last issue:

"Mr. Herbert Holland, who shot the Prothonotary says: The little fellow was entirely alone, and was very tame, as if wearied. This may have been the case, if we may judge from the much worn tail and wing feathers.* The capture was made under a dam upon a small stream near here, and the spot was very swampy."

AN ENGLISH CORN-CRAKE IN RHODE ISLAND.— Being recently called to name a portion of the birds in the Franklin Society collection, I found among them one of this species. On the bottom of the stand was written—"Land Rail, Cranston." As this collection was made by Mr. Newton Dexter, and by him presented to the society, I made inquiry of him. He says it was killed in Cranston about the year 1857, and taken by the sportsman to Mr. Pertia Aldrich, from whom he received it in the flesh

CORRESPONDENTS have favored us with the following variations of color of iris:

Bald eagle, adult, bright gamboge yellow.

Bittern, straw.

Wood Duck, male, yellow.

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* Quite a considerable proportion of a number of our small birds reach here in spring in worn plumage, while that of other individuals is fresh and bright. We think several species moult but once each year, and that some individuals of other species do the same. We invite correspondents' opinions on this subject.

The Roseate Spoonbill in Florida Rookeries.

PART IV.

MARCH 17th we visited another and much larger rookery, about twenty-five or thirty miles north of the preceding one. The bushes and briers forming the outer wall of this one were impenetrable, and had to be cut down in order to get our boat in. The pond was much larger than that in the preceding, and a considerable portion of it was free from bushes. Fifty alligators could easily be counted as they lay on the shore, or in the various positions they take as they lie upon the water; some floating from tip of nose to tip of tail, others from nose to middle of back, others with head only above, and still others with only the knob on their nose and their eyes above, and so unsuspecting were they that we hooked into one with the boat-hook and enjoyed quite a ride; another took a crow offered to it from my hand, and held it unconcernedly in its mouth, while the boat went by within a foot of it.

A flock of from six to ten Everglade Kites, *Rostrhamne sociabilis plumbeus*, were sporting about like so many swallows over the pond and adjoining marshes, and were not in the least afraid of us. In general, the incubation in this rookery was much behind the last. We found but a couple of Spoonbills' nests with eggs, although there were three or four score of the birds to be seen. The first day we did no shooting but confined ourselves to egging. Young birds of even American Egrets and Snake-birds, were scarce, by far the majority of the nests having eggs, many of which were fresh, and as in the case at the first rookery, ten days previously, the Snowy and Louisiana Herons' had in most cases their complement of four fresh eggs each. The Fish Crows were far more numerous than before, and so fearless that we sometimes approached near enough to almost grasp their feet with our hands. We almost groaned in spirit as the contents were taken from a Spoonbill's nest directly before our eyes. But we felt powerless to prevent it, knowing the birds would leave by thousands when the firing began.

March 18th we secured fourteen Spoonbills and shot down two or three others which the 'gators appropriated. We also took three Everglade Kites, and it was fortunate that we did so, for on the following day the place was almost deserted, only one Spoonbill being taken. There were, however, a number of White Ibis at one end of the pond where a clump of Cabbage Palms grew. They were not there the day before during our shooting, having left for their feeding-grounds early in the morning, and returning at night, else they might have abandoned the place also. An investigation revealed the fact that they had just begun laying, and one egg each was taken from about twenty nests. These nests were placed among the dead stems of the palm leaves, and were quite difficult to climb to because many stems would break away when laid hold of.

At this place a Pileated Woodpecker was excavating for her nest within a gunshot of our tent. And on the day of our departure we investigated it, but the bird had not begun laying. We broke camp, and returned to Indian River on the 20th.

Since the above article was written, I have received a spoonbill from Tampa, Fla., which has nearly the entire neck tinted, many of the feathers having pink tips. It is otherwise a highly colored specimen, and as it was shot in November it may prove that this species is in its highest plumage during the autumn.

WHAT collector is there, who in his younger days has not forgotten his powder-flask, caps, or even ramrod?

A prominent writer relates as follows, regarding his first crow's nest: It was in a large tree very difficult to ascend, but by laborious climbing he reached it, and safely secured the eggs, which he put in his hat. The descent was by no means easy, but the ground was reached in safety. His dismay may well be imagined upon discovering that he had left hat and eggs on the nest.

BRAVE JAY.— We are knowing to the fact, that a boy found a blue jay's nest, and on climbing to it, found it to contain young. At this juncture the old bird returned and fiercely flew into the boy's face; then alighting on his shoulder it pecked his face till it bled. He says he won't climb to any more jays' nests.

American Otter—Lutra canadensis.

The occurrence of this animal in Rhode Island is much more frequent than is commonly supposed, since the creature is generally shy and wary in his habits, and better paying business has served to discourage hunting and trapping.

Out-of-doors students or collectors of any zoölogical objects, have frequently to notice the wonderful adaptability of plumage, pelage, general form, and habit of movement, to the concealment of the creatures sought for, deceiving the most practiced eye, and altogether likely to hide them from any but the careful observer.

We have known of two of the *Lutra canadensis* being taken the past few months, one at Portsmouth, the other at Pawtuxet, while in the month of March, 1883, a magnificent specimen was killed near Bristol. Tracing back for a few years, we are able to get reports of several more.

All the specimens examined were taken in early spring, and a general description answers for both sexes. A long and rather heavy body, mounted upon legs very short in proportion, the hind pair the stouter, and the feet, when spread out, broad and round, the toes connected by a membrane, the callous spots on the soles divided by bands of fur. The neck is rather long, ears very small, the face broad and rather flat, with small eyes, and as a particular mark, the nose-pad, which has been described by Dr. Coues as shaped like the ace of spades.

These specimens weighed about eighteen or twenty pounds each, and measured from tip to tip from forty-six to forty-eight inches, the tail, which is flat and tapers to a point, being about seventeen or eighteen inches long, and were of a rich brown color above, almost black in some lights, a trifle lighter below and on the inside of the legs, while the lips, cheeks, chin, throat, and breast were a dirty whitish brown.

These specimens exhibited great strength and most vicious disposition. The one killed at Bristol was taking a morning stroll across lots, when he was confronted by the farmer's dog. This resulted in a furious unpleasantness, and the dog would speedily have had the worst of it had not the master appeared, and with a club decided the battle. Nevertheless they are said to have been very thoroughly tamed, and to exhibit considerable playfulness.

They are said to be very fond of sliding, choosing a steep clay bank that slopes into a stream, but probably from lack of proper situation, and because the thickly settled condition of the country obliges them to be more cautious, we get no reports of any slides in Rhode Island. Audubon says: "The otters ascend the bank at a place suitable for their diversion, and sometimes where it is very steep, so that they are obliged to make quite an effort to gain the top; they slide down in rapid succession where there are many at a sliding-place. On one occasion we were resting on the banks of Canoe Creek, a small stream near Henderson that empties into the Ohio, when a pair of otters made their appearance, and began to enjoy their sliding pastime.

"They glided down the soap-like, muddy surface of the slide, with the rapidity of an arrow from a bow. We counted each one making twenty-two slides before we disturbed their sportive occupation."

During the winter they pursue their pastime on the snow. Godman says: "Their favorite sport is sliding, and for this purpose, in winter the highest ridge of snow is selected, to the top of which the otters scramble, where, lying on the belly with the fore-feet bent backwards, they give themselves an impulse with their hind-legs, and swiftly glide head-foremost down the declivity, sometimes for the distance of twenty yards. This sport they continue, apparently with the keenest enjoyment, until fatigue or hunger induces them to desist."

Squirrel Incidents.— Mr. Wm. Temple reports that while out shooting last fall, he had paused to listen, when out of a hole near the butt of a tree, came a red squirrel. It made directly toward him, and, probably taking him for a stump, ran up his left trousers-leg and coat, then across his shoulders and down the other side to the ground. It was deliberate in its movements and made frequent stops, as is its custom when not alarmed.

Mr. G. M. Gray was out during the latter part of April with a dark-lantern, catching moths, when he received a violent blow in the face, the missile falling to the ground, but immediately began ascending his pants, for it was a flying-squirrel. It soon discovered its mistake and sprang on to a tree near by.

Quartz.—Rock Crystal.

Quartz is the most abundant mineral in the world, and in its clear, limpid, and crystalline state, appears as wonderful and elicits as much admiration from the casual and unscientific observer as any two others that could be mentioned.

Diamond Hill, in Cumberland, this state, has more than a local celebrity for its encrustations of crystals that face the rocks all over the hill, in druses like sugar, or often protruding one-sixteenth to one fourth of an inch.

At the Dexter lime rock, in Smithfield, occur beautiful crystals, often limpid, in veins of quartz intersecting the limestone. One perfect specimen is reported, six and three-fourths inches long and one inch in diameter.

Regarding other and more notable localities, we quote from the article on Gems and Precious Stones, by G. F. Kunz, published by the Department of the Interior:

"Rock crystal is found at a great many localities in America. In Herkimer County, at Lake George, and through the adjacent regions in New York State, the calciferous sandstone contains single crystals, and at times large cavities are found filled with doubly-terminated crystals, often of remarkable perfection and brilliancy; these are collected in numbers, cut, and often uncut, are mounted in jewelry and sold to tourists under the name of 'Lake George diamonds.' Those sold in large cities under the same name are, however, often simply paste or glass, which possess more brilliancy but have not the same durability. Of the Herkimer crystals possibly $3,000 worth are sold per annum.

"In Arkansas, at Crystal Mountain, and in the region for about forty miles around Hot Springs, large veins of quartz are frequently met with. The quartz is taken to Hot Springs and Little Rock by the wagon load by the farmers, who often do blasting to secure the crystals, looking for them at such times as their crops need no attention. In the course of a year possibly one hundred loads are sold, principally as mementoes, to the visitors at these resorts. Crystals are also sent to other localities for sale. Usually only one-half of the crystal is clear, and a clear space over two inches square is quite uncommon. The sale of the uncut ones from this region amounts to fully $10,000 per annum.

"At Hot Springs, clear, rolled pebbles are often sold, that have been found on the banks of the Ouachita; these are more highly prized than the crystals, as the common fallacy prevails that they cut clearer gems. The scarcity of these and the demand for them has so worked upon the cupidity of some that they have learned to produce rolled pebbles by putting numbers of the crystals in a box which is kept revolving for a few days by water-power. Any expert, however, can discern the difference, since the artificial ones are a little whiter on the surface.

"Many localities in Colorado furnish fine specimens. Large masses of clear rock crystal have been found in North Carolina, and would be of use in the arts.

"At many places large quantities of the quartz cut in gems, seals, and all manner of ornaments, are sold as having been found in the vicinity. Sometimes even the stones that have been found by the visitors and brought by them to be cut, are exchanged for those already cut and brought here from Bohemia, Oldenburg, and the Jura, where cutting is done on a large scale and by cheap labor; the cut stones costing, delivered in America, not more than one-tenth of the price of cutting done here.

"The annual sale of cut stones and money expended in cutting, at the different localities, may amount to $20,000 or more per annum, and the sale of specimens to as much more.

"The clear crystal for optical purposes, used in this country, is almost entirely from Brazilian,— not that the American is not fine enough, but the good material found here rarely reaches the proper channels, and the Brazilian is cheap and is used from custom."

Late Crossbills, L' americana. — On April 27, Mr. G. M. Gray observed a flock of about a dozen Red Crossbills in East Providence, R. I. His attention was attracted by their chattering, and after alighting they permitted a near approach.

On Saturday, May 10, Mr. Arthur Miller killed a Red Crossbill, which he sent to us with the remark that there was quite a flock of them. This was at Barrington, R. I.

SEDGES.

Sedges are grass-like plants, mostly growing in moist localities. They are of very limited economical use, and their interest to students has always been in the beauty of their minute parts and in the difficulty of their study. While, as a general thing, lacustrine or littoral plants, some grow in dry woods or fields, and not a few on Alpine mountain-tops. Thus *Carex rigida* and *Carex scirpoidea* we have found on the summit of Mt. Lafayette. Many other genera than *Carex* are included in *Cyperaceæ*, as the bulrushes, the golingales and the spike rushes. All these yield in interest to the true sedges, which have fascinated so many acute students. It is of these we shall here speak. They should especially attract Rhode Islanders, for the reason that we possess, in the herbarium of Brown University, an exceptionally fine and authentically-named collection. Special students of *Carex*, both here and abroad, must needs consult it. Here are many type forms, copious notes, and graphic illustrations, in the bequest of Colonel Olney.

True sedges, we have said, were grass-like in appearance; indeed, they are popularly confused with grasses. From these they differ in many essential particulars. The first thing we notice is the generally triangular stem, which is not jointed nor hollow. The flowers are of two kinds, either on separate plants or on different parts of the same plant, or commingled in one inflorescence. The starminate or mole flowers are of comparatively little account in the identification of species. A very close study, however, is given to the pistillate flowers. These consist of a flask-like or sack-like body, formed by a union of bracts, and inflated in various degrees or not at all. It is called the *perigynium*, and is the bugbear of young students. It assumes very various forms and diverse colors, is sometimes beautifully nerved, sometimes clothed with hairs, and often drawn out into a besk. Within is found the akene or fruit, which may be lenticular or triangular, smooth or rough. The flowers are arranged in spikes, and these are of different numbers and relative positions in the diverse species. They may also be very close together or more or less remote. It would be quite impossible, in a brief popular account, to enter much more fully into the recondite points of structure of this vast genus. Often the differences between species is extremely slight; indeed, we conjecture that they may dwell only in the imagination of some prolific author.

There is probably no object in nature so humble that a devoted student would fail to find in it an increasing delight. In these useless plants there is a perennial joy to those who love them. The pose of many of them is beautiful. Sometimes the masses of spikes resemble an old weapon of war, with its steel points of offence; sometimes they are graceful tassels dangling in the breeze. Usually the leaves are narrow like those of grasses, but in *Carex Froseriana*, and some others, become broad and conspicuous. — *Providence Journal.*

Frogs and Toads.

The difference between frogs and toads may be summed up as follows:

Beginning at first principles, they both lay their eggs in water; those of the frog are, soon after their deposit, about the size of a pea, jelly like, and adhering in large masses, while the toad lays a long string in two rows.

Frogs have smooth skins and are chiefly aquatic, though they come frequently to land and there obtain much of their food. Toads are smooth when young, but soon become covered with warty prominences, which contain a whitish fluid. The two large spots on each side of the head, at the back, discharge most freely. This fluid is not poisonous, nor does it produce warts upon one's hands, as is often reported, but is to the toad a valuable means of defence, as it is particularly unpleasant to most animals who would seize him with the mouth, either in sport or for food.

Frogs have teeth, the toad has none. Frogs seem to prefer to get along in the world by jumping, while the toad frequently walks.

Observing some toads singing, a short time since, they were seen to inflate the throat remarkably, often to the size of a shag-bark nut, and in some cases they were not disturbed when we stooped down and tickled the throat with the finger.

Our eastern North American toad, is *Bufo lentiginosus* of Shaw. the northern variety, *americanus.*

The Shell-Bearing Mollusca of Rhode Island.

[BY HORACE F. CARPENTER.]

CHAPTER VI.

4. PURPURA (POLYTROPA) LAPILLUS, LINN.

Syns.:

Buccinum lapillus, Linn. Penn. Wood. Don. Mont, etc.
Tritonium lapillus, Muller.
Purpuro-buccinum, Da Costa.
Purpura lapillus, Lam. Kiener. Gld. DeKay. Stimp., etc.

Shell ovate, acutely pointed at both ends, thick and solid, with almost every variety of coloring, from pure white, through yellow to dark brown, some with bands of white, yellow or red, of various widths. The shape of the shell and its surface is also much varied, as are nearly all littoral shells; some specimens being perfectly smooth, and others very rough to the touch; some have raised, acute, turreted spires, while others are flattened below the suture. The aperture is oval, the outer lip curved and sharp, but thickened and armed within with blunt teeth; inner lip smooth and somewhat flattened. Length, one and one-fourth inches. Breadth, seven-tenths. These shells are not found in our bay, but inhabit the ocean rocks at Newport, and are common on both sides of the Atlantic, extending northwards to the Arctic seas. The geographical centre of this species is in northern Europe, the American as well as the southern European and African specimens being stunted in size. Its fossil distribution extends as far back as the Red Crag of England. It is carnivorous in its habits, feeding upon dead fish, mussels, and bivalve shells generally. It is especially fond of oysters, and is considered a very destructive enemy to the oyster-beds in England.

Most of the Purpuræ contain a liquid which produces a crimson dye, obtained by pressing on the operculum or by crushing the shell. The celebrated Tyrian dye of the ancients is supposed to have been made from these animals. When this liquid is applied to linen and dried in the sun, it first appears of a light green color which changes to a deep green, then into blue, and then to a deep purple red; if now the linen be washed in hot water and soap and again dried in the sun, it becomes of a beautiful bright crimson, which is indelible, and without the use of any other reagent to set it.

FAMILY 2. TRITONIDÆ, containing four fossil genera and three recent genera and eight sub-genera, with one hundred and three fossil and one hundred and forty-four recent species, is not represented at all in New England.

FAMILY 3. FUSIDÆ, comprising four sub-families, ten genera, seventeen sub-genera, three hundred and thirty fossil and one hundred and sixty recent species, is not represented in Rhode Island.* One species only, Ptychatractus ligatus, Migh and Adams, is found on the coasts of Maine and northwards, in deep water.

FAMILY 4. BUCCINIDÆ, is divided into six sub-families, twenty-six genera, with six sub-genera and hundreds of species, both recent and fossil. This immense family is represented in Rhode Island by three genera and five species, as follows:

SUB-FAMILY, NEPTUNIINÆ.

GENUS, SIPHO, KLEIN.

Shell thin, pyriform or fusiform, not tuberculate or spiny, smooth and rounded whorls; spire moderate; canal produced and recurved. Operculum ovate, nucleus apical.

5. SIPHO STIMPSONI, MORCH.

Dist. Long Island to Labrador. Deep water. This shell has until recently been confounded with Sipho Islandicus, which is a northern shell, inhabiting Iceland, and Greenland to Labador, and Norway to Scotland. It is more ventricose than that shell, with a shorter, wider and more curved canal. A robust shell, with a dark, rough epidermis. Length, two and one-quarter inches, breadth about one inch.

6. SIPHO PYGMÆUS, GOULD.

Shell white, under a yellowish epidermis: whorls six, and preserving the same outlines as the previous species. The comparative length of the aperture is less, and the striæ are more numerous and more rounded, while the apex is more pointed than in S. Stimpsoni. Length, fifteen to twenty mill. Connecticut to Newfoundland.

GENUS FULGUR, MONTFORT.

Shell pear-shaped, thin; spire short, the angle of shoulder spinous; body-whorl very large; canal long and twisted; lip and columella smooth. Operculum ovate, nucleus apical.

7. FULGUR CARICA, GMELIN.

Syns.:

Murex carica, Gme.
Pyrula carica, Gould. De Kay.
Fulgur carica, Gill. Dall. Tryon, etc.
Dist. Atlantic coast from Cape Cod to Florida.

Shell large, solid, pear-shaped, cinerous; spire a low, pointed cone; suture well-defined but not channeled; whorls six, body-whorl large, crowned with a series of triangular nodules, or spines, one at each stage of growth; aperture large, long, ovate; outer lip simple and sharp; inner lip callused and twisted; canal long and flexuose; interior of aperture brick red, or a light fawn color. Operculum ovate, thick, with a broad callus around the inner edge; outer surface of operculum rough and coarse, color, greenish yellow; inner surface of a waxen texture.

This is the largest shell found in Rhode Island. Its size is seven inches in length by four in breadth. It belongs to the southern portion of the Atlantic Province, and is found on the coasts of the Southern States, of larger size and more brilliant color than those found here. It is not found north of Cape Cod. Its proper habitat is in the Laminarian Zone, but is sometimes found on sandy shores between tides.

The animal lays its eggs in March and April. The eggs of marine Gasteropods are called ova cases. In this species they consist of a series of membranous cases, from fifty to seventy in number, about the size and thickness of an old-fashioned copper cent; these are fastened together by a string or cord of the same substance, attached to their upper edges; they are placed about one-fourth of an inch apart, those cases forming the centre of the string being the largest; from the centre to each end they taper gradually in size, forming a string of cases a yard in length; each case has eleven ribs radiating from the point of attachment, and scalloping the edges, which are beveled nearly to a point; opposite the ligament is a small opening through which the young escape when sufficiently matured; each case contains forty or fifty embryos, which when ready to escape from their imprisonment are about one-sixth of an inch in length.

The animal is large, dirty white to almost black; mantle thick, white, edge plain, proboscis long, cylindrical; tentacles short, triangular; eyes on the outer side, near the base. Carnivorous in its habits, and is found more abundantly near oyster-beds, where it commits great ravages.

(To be continued.)

CURIOUS MONSTROSITIES.— We recently had a lamb to mount, which had one head and two bodies joined together on the chest, so that when standing, the legs on the body which joined beneath pointed upwards. It had eight legs, four ears, and but one eye, which was large and situated in the centre of the forehead. A correspondent now writes he has a pig that is a doublet, but differs from our sheep in having three eyes. We have had in our possession during the past six years three four-legged chickens, gotten up on two different patterns.

THE Walker prize of the Boston Society of Natural History has been this year awarded to Mr. Albert H. Tuttle, of the Harvard Medical School, Boston. His subject was the embryology of *Lunatia heros*, thoroughly illustrated.

A SCIENTIST says: "The paleozoic cockroaches are distinguished from living species by having five veins in the wing instead of four, and have a decided mesozoic aspect." This is highly important; but a woman when she sees one of these insects, will not care whether it has five or fifteen veins in the wings. She will give a scream, draw her skirts tightly about her, and give the bug such a rap with an old shoe, that it will have more of a mashed than a mesozoic aspect. — *Norristown Herald.*

CONCHOLOGICAL CHECK-LIST. VI.

J. RITCHIE, JR.

Family. Cyclostomacea Pfr.
Sub-family. Cyclophorea Pfr.
Cyclophorus luridus Pfr.
lutescens Pfr.
maculosus Sow.
malayanus Benson.
malleatus Blanf.
margarita Pfr.
marmoratus Fer.
martensianus Möll.
martinezi Hidalg.
menkeanus Phil.
metabletus Cross et F.
mexicanus Menke.
microscopicus Morl.
milium Benson.
montronzieri Souvrb.
moricandi Pfr.
nilagiricus Benson.
nivicola G. Austen.
obligatus Gould.
oculus-capri Wood.
orophilus Benson.
pæcilus Pfr.
parapsis Benson.
parvus Sow.
pearsoni Benson.
perdix Brod et Sow.
pernobilis Gould.
phænotopicus Benson.
philippinarum Sow.
picturatus Pfr.
pinnulifer Benson.
pirrieanus Pfr.
planorbis Blanf.
plicalus Gould.
poecilus Pfr.
polynema Pfr.
polynema Mörch. (*Lagocheilus*).
ponderosus Pfr.
porphyriticus Benson.
psilomitus Pfr.
punctatus Sow.
purus Forb.
pyrotrema Benson.
raripilus Morl.
Cyclophorus ravidus Benson.
rufescens Sow.
salleanus Mrts.
saturnus Pfr.
scissimargo Benson.
scurra Benson.
semisulcatus Sow.
semistriatus Sow.
shiplayi Pfr.
siamensis Sow.
Not found in Siam, re-named khasiensis Nevill.
speciosus Phil.
stenomphalus Pfr.
stenostomus Sow.
striatulus Pfr.
strigatus Gld.
striolatus Stol.
sublævigatus Blanf.
tenebricus Adams et Reeve.
texturatus Sow.
theobaldianus Benson.
thersites Shutt.
thwaitesi Pfr.
tiara Gould.
tigrinus Sow.
tissotianus Cross.
tomotrema Benson
triliratus Pfr.
tristis Blanf.
trochoides Stol.
tryblium Benson.
tuba Sow.
turbinatus Pfr.
turbo Chem.
turgidus Pfr.
upolensis Mouss.
validus Sow.
voloulus Müll.
wahlbergi Benson.
warnefordianus Nevill.
wilsoni Pfr.
woodianus Lea.
zebra Grateloup.
zebrinus Benson.
zollingeri Mouss.

AT LAST!

Volume I. of the Water Birds of North America has appeared.

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MR. J. S. JOHNSON, in the *Naturalist's Journal*, describes an instrument useful for capturing moths, etc., that have once been disturbed, or are in obscure places, under bark, small twigs, etc. He says: "*The gig* is made from a metallic pen-holder; to prepare one, cut off the part where the pen is inserted, and force in a piece of wood, to which is fastened three needles set in a triangle, projecting from the holder half an inch or so. When not in use it can be carried in the pocket like a pen-holder; by simply reversing the plug, the holder forms a sheath for the needles.

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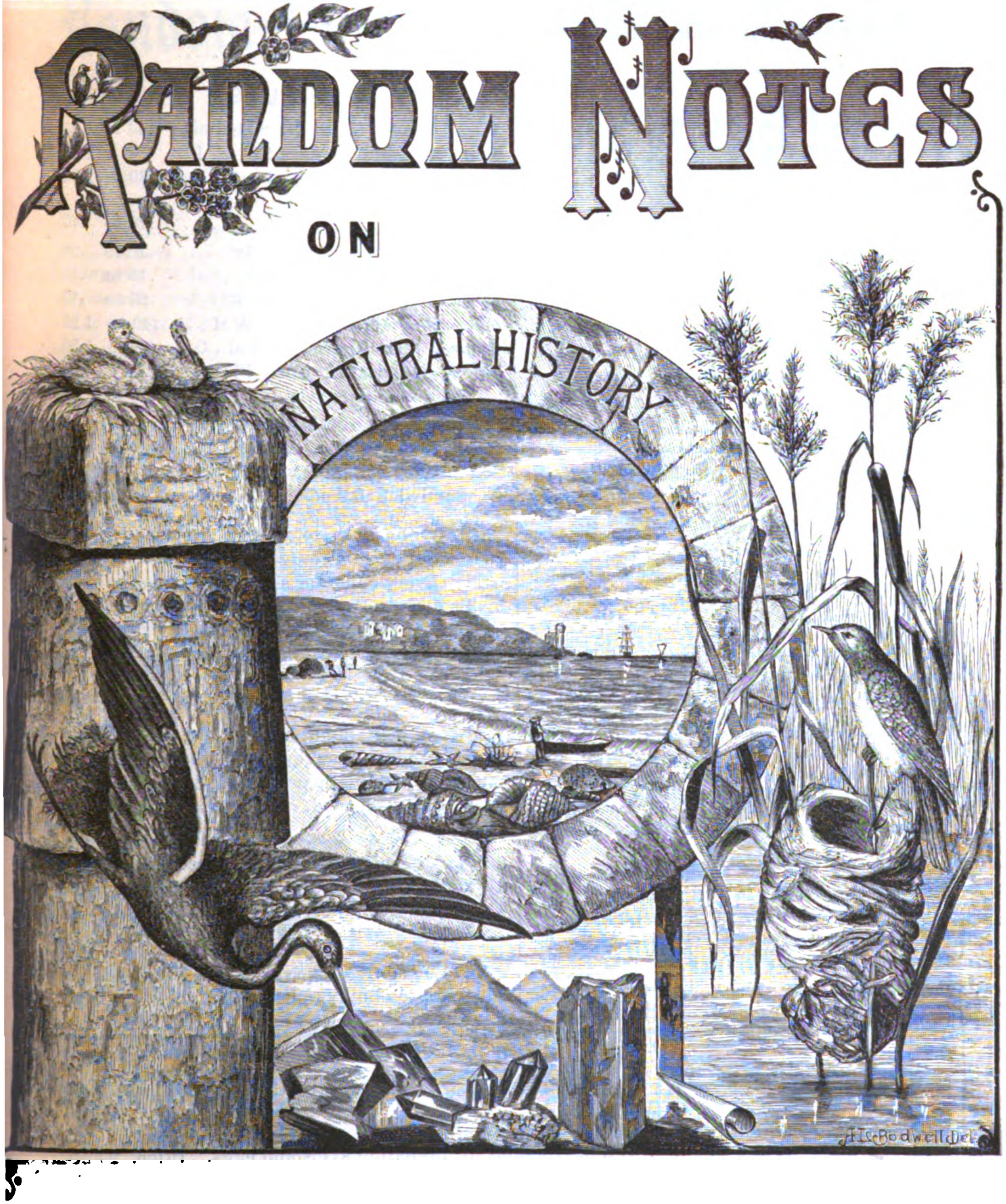

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Vol. 1. PROVIDENCE, JULY, 1884. No. VII.
Entered at the Providence Post-Office as Second-Class Matter.

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SPECIAL NOTICE.

Supscriptions hereafter will begin with the current number, or the March number if desired.

Great Gray Owl. Spectral Owl.

Strix cinera.

Late in the winter of 1882 and '83 some persons shooting on Fox Island, near Wickford, killed a large ashen-colored owl, and sent it to Providence to be stuffed by an amateur.

Mr. G. M. Gray chanced to see it before work was commenced, and noting its peculiarities, made a liberal cash offer for it. The fact that two persons had fired at it, and both claimed the killing, made them willing to sell, and he secured the prize. It was the Great Gray Owl, and is the only reported capture for Rhode Island. A specimen in the collection at Brown University is said to have been taken in Seekonk, Mass., some twenty years ago.

This owl resembled very closely the common Barred Owl, *S. nebulosa*, but measured about four inches longer, and had a much greater extent of wing. The general appearance of great size is caused especially by the extreme length of the soft feathers, for the body after skinning was scarcely larger than that of the average Barred Owl. A prominent distinguishing mark is the yellow or straw-colored iris. The Barred Owl has a very dark hazel, but after death and when the pupil is dilated, the appearance is blue-black, or black.

For further description of the Great Gray we quote from Dr. Coues' new work: "Feet completely feathered to the claws, bill yellow; six primaries cut on inner web; entire upper parts dark brown, mottled with grayish white in confused and intricate pattern; wings and tail similar, broken-barred with grayish-white marbling; under-parts of the same dark brown and pale gray, the pattern in streaks on the breast, in cross-bars on the belly and flanks, in spots on the feet; the great facial disc watered with dark brown and light gray in regular rings, concentric with each eye, the outmost ring dark brown and stronger than the rest, bounded below with a ragged white collar.

"An immense owl, one of the largest of all, inhabiting Arctic America, straying irregularly south into the United States in winter, even to New Jersey, Illinois, and California; said to be common from our northern border northward, and perhaps resident in northern New England. Nest in trees, of sticks, moss, and feathers; eggs usually three or four, not equal-ended, and rather small for the bird, 2.25x1.80.

"Like others of the genus it is a wood owl; while its prowess enables it to prey upon creatures up to the size of grouse and hares."

Dr. Coues states that the Great Horned Owl, *Bubo Virginianus*, often appropriates the nest of some large hawk, such as the Red Shouldered. We have just learned of three boys who made a raid upon a Fish Hawk's nest for eggs. The nest was extra large and the climbing a test of endurance. The contents of the nest proved to be two young Great Horned Owls, in the down. They were finally dislodged and are now thriving well in captivity.

A gentleman being on Boston Common June 16, about noon, noticed a Robin, (*Turdus migratorius*), fly down several times fairly into the pond, paddle about and thoroughly wet himself. The sun was shining and the heat quite excessive, and the bird seemed to thoroughly enjoy his plunge bath in deep water.

The Rodentia of Rhode Island.

All animals belonging to the order Rodentia are distinguished by having between the front cutting teeth and the flat grinding back teeth, on each side of both upper and lower jaw, a long toothless space. Young hares have six upper front teeth, but soon shed two of them, and two of those that remain are small and supplementary, and placed not on each side, but directly behind the true and prominent front teeth. So that all rodents, when viewed in front, seem to have only two upper front teeth, and none have more than two in the lower jaw. These front teeth (called incisors) are long, slightly curved toward the mouth, and are extremely hard on the outer face, while the opposite side is soft. The tips of these upper and lower teeth meet when the mouth is shut, and their action upon each other serves to keep them all sharp, and worn away behind. They grow out rapidly from the jaw, and if they do not have continual rasping, or one is broken away, the owner suffers in consequence, by an unnatural length, the opposite tooth frequently growing around to complete a circle, and entering the jaw again, interferes with feeding and finally kills its owner. For this reason the cracking of nuts for pet squirrels is not a kindness, and I think also that the little animals, with seemingly no knowledge of the consequences, or because they cannot conquer their appetites for the softer dainties offered them in captivity, neglect the harder shelled nuts, to their own great disadvantage. The back or grinding teeth vary in the different families, often twelve, but with sixteen to eighteen among the squirrels, and twenty-six to twenty-eight among the hares.

The question, "What is the difference between a rabbit and a hare?" has been frequently answered, but still is not generally understood, and the two names are applied interchangeably and indiscriminately to the same animals. We have in America no true rabbits, that name belongs to the European species, *L. caniculus*, which is a persistent burrower, very prolific, and shorter and stouter in form, with comparatively short ears and hind legs. This animal has been naturalized all over the world, and all the various kinds of pet rabbits are derived from it.

The largest representative in Rhode Island of this order is the American or Varying hare, *Lepus Americanus var. Virginianus*. This species has a habit of keeping very close to cover, and its resort is thick swamps, among cedars and tangled briers, where it makes a nest or form, of grass, in which it sits. It is not very plentiful with us, and we have never met with it, but it occurs in the swamp in South Kingstown, and several energetic hunters in the northern part of the state report it. The creature averages about twenty inches in length, and the summer pellage is generally a cinnamon brown mixed with black, chin, throat, and under parts white, breast and front of neck yellow-brown, the brown hairs have broad tips of black, the short tail sooty brown above, and gray white below. In winter it changes with some variations, to nearly pure white, retaining generally a narrow band of black on the tips of the ears.

The Wood Rabbit, Gray Rabbit or Molly Cotton-tail, *Lepus sylvaticus Bach*, is well distributed through the state, and is plentiful in some sections. The length is about sixteen inches, the color of the pellage, which varies but slightly, if at all, with the changing seasons, is yellowish or reddish brown on the back, with black lines, the sides of the body light gray and brown, throat gray, under parts white, the short elevated tail same color on top as the back, and pure white below. With this exception, all the fur, which is soft and dense, is lead-colored at the base. This species, with varieties, is distributed all over the United States, and makes usually a form in the grass, but is said to make use of a hollow stump or stone wall, and frequently appropriates the burrow of some other animal, or, perhaps, digs one. In this respect, and in its compact shape, it approaches nearly to the true European rabbit. The hares are liable to the attacks of many enemies; ticks and tape-worms are their parasites, while all carnivorous animals, and man with gun and trap, pursue them relentlessly. Possessed of no means of defence, they would be liable to extermination, were it not for their great fecundity, their swiftness of foot, and that their ears and eyes are always on the alert. Their food is strictly vegetable.

PÉLÉS' HAIR.

The volcano of Kilanae, at Hawaii, Sandwich Islands, has for all known time been open and active. The situation has been described as "a vast chasm in the earth five or six times the depth of Niagara Falls, and seven or eight miles in circumference; think of this upon the flank of a huge mountain — a mountain gradually piled by powerful volcanic agencies for centuries past — and as a place ample in accommodation for the upbuilding of a great city, where the loftiest spires, viewed from the rim, would seem small and low, and all about are strewed abundant evidences of the great unrest — of billows of flame eternally swaying to and fro in the fathomless molten abyss, of jets of fire flowing in hot haste to form mounds and cones, of sudden spouts of scorching lava flashing and glowing as such only can, and all surrounded and kept back, as it were, by an irregularly formed elliptical wall of basaltic rocks, rearing itself a thousand feet above the surface of the lava and descending to unknown depths, while, terrace-like, six hundred feet below the verge, one may note a vast amphitheatre gallery of black indurated lava, once a brilliant, glowing mass, upon which might now be ranged on a drill a hundred thousand men. Not to the eye alone appeal impressions of grandeur; sepulchral tones fall on the ear — sharp whizzing calls, ringing like steel, and fierce as the whirlwind's breath, as gas and steam, rushing with varying force, seek through obstructed apertures entrance to light and freedom.

"Scores of craters rise from the fiery abyss, from which shoot out columns of gray smoke and pyramids of brilliant flame, while glowing ribbons of fire sweep onward to the seething caldron below; where in eternal numbers, 'deep calleth unto deep.' If grand by day, by night it becomes 'fearfully glorious,' every wave glowing with fervent heat, every point and pyramid of flame a thousandfold intensified in beauty."

In this abyss the Goddess Pélé was by the natives supposed to reside, and over the island and their destinies to exert an all-powerful influence.

One of the island queens, having become a convert to Christianity, accompanied by her trembling subjects, went boldly to the crater's mouth, threw in her slipper, and emptied in the contents of her wash-bowl.

"The shackles of superstition had been broken, and henceforth those timid South Sea Islanders would no longer do reverence to Pélé, the phantom queen."

Upon the mountain side collectors and tourists occasionally find masses of soft, shining, gray locks, not unlike human hair. These are particles of molten lava that have been caught by the winds, and drawn out to hairs like spun glass; whirled about by the varying currents, they become tangled together, and are floated over the sides of the crater.

In the *American Journal of Sciences*, August, 1879, Prof. James D. Dana says: "I have now to report two new satisfactory analyses of the capillary volcanic glass of Kilanae.

"For these, science is indebted to F. J. Allen, of the Sheffield Scientific School of Yale College, excepting the determination of the state of oxidation of the iron, which is by Prof. O. D. Allen. The results were as follows:

	I.	II.	Mean.
Silica	50·76	50·74	50·75
Alumina	16·68	16·39	16·54
Iron sesquioxide	2·15	2·05	2·10
Iron protoxide	7·90	7·87	7·88
Manganese protoxide	trace	trace	trace
Magnesia	7·65	7·65	7·65
Lime	11·95	11·97	11·96
Soda	2·11	2·16	2·13
Potash	0·55	0·57	0·56
Ignition	0·35	0·35	0·35
	100·10	99·75	99·92

An important paper on the microscopic characters of Pélé's Hair has been published at Tubingen (in 1877) by C. Fr. W. Krukenberg, in a pamphlet giving also the results of the author's investigations on Tachylyte, and Hyalumelan, Glassy Porous and Sphaerulitic Basalt and Obsidian. He states, and illustrates by figures, the following facts respecting Pélé's Hair: The fibres are sometimes bent and coalesced into loops; often are tubular; frequently contain air bubbles, and occasionally microlites. There is usually an enlargement of the diameter whenever a crystal (or microlite) exists within, and also about many of the air-cavities. The crystals are mostly rhombic, but as to their kinds the author makes no suggestion.

THE RHODE ISLAND ENTOMOLOGICAL SOCIETY

held its annual meeting June 6, resulting in the election of the following officers:

President—Edwin E. Calder.
Vice-President—Herbert Terry, M.D.
Secretary—Frank E. Gray.
Treasurer—Charles W. Biddles.
Standing Committee—J. M. Southwick, John A. Armstrong, Miss Mary C. Smith.

MEETING OF THE PROVIDENCE FRANKLIN SOCIETY.

A regular meeting of the Franklin Society was held June 16.

The president called attention to specimens of water-worn rocks, picked up at Beaver Tail, on the excursion of June 14. An iron-stone specimen was recognized as a Cumberland Hill fragment, and two others as the peculiar kind of rock from the Central Falls ledges, all having been transported to the Beaver Tail locality by glacial action.

Mr. D. W. Hoyt gave a very interesting explanation of the Snake Den ridges and the valley between, and what he believed to be the glacial action by which the "Round Rocks" boulders were transported from the ledges to their present position. He believed the rocks to be a terminal moraine of a comparatively thin glacier, the last of the great ice-fields of this region. An examination of the ridges and valley showed conditions which exactly fitted the theory of the transportation of the boulders, while their identity with the ledges was perfect. Mr. Hoyt has spent a day in taking measurements and examining this region, and expects to do more work upon the geology of this region.

Dr. W. O. Brown spoke briefly of the importance of a survey of the state, and of what had been already done. He also gave an instance of a man in Johnston saving his orchard from the ravages of the canker worm by showering the trees with a mixture of Paris green and water, it being perfectly effective.

The president announced the following Botanical Committee: George Hunt, Thomas Battey, D. W. Hoyt, and Mrs. Alden. Adjourned to the call of the secretary in September.

THE LONSDALE BOTANICAL AND FIELD NATURALIST SOCIETY.

held its regular meeting June 9. A large number of members were present, it being the annual flower exhibition of the Society. The display was good, showing that the collectors must have examined considerable country to obtain so many varieties.

For the best bouquet of wild flowers the first prize was awarded to James Moss, second prize to Thomas Dearden, Jr. For the best three wild flowers, the first prize, John Dearden; second prize, James Moss. For the best bouquet of cultivated flowers, first prize, James Lord; second prize, James Isherwood. For the best three cultivated flowers, first prize, John Osborn; second prize, John Dearden; third prize, James Moss.

Mr. Thomas Lambert exhibited a Bird of Paradise, a Trogon, and a Scarlet Ibis.

We are informed that Mr. John Krider, of Philadelphia, has sold his stock of birds' eggs to Dr. Detwiller, of Bethlehem, Penn.

Have watched the building of the nests of the Marsh Hawk this year. Of the five nests found, two were composed of a small quantity of grass and remained so. The remainder were started with a simple foundation, but were added to every day until they made substantial nests. One I visited June 2 was still being added to, although the young had been hatched for several days.

Found a Towhee's nest containing one egg of her own and three cowbird's.

G. S. A.

A French engineer, after a series of experiments with a loaf of bread baked by a Vassar College girl, now announces that the project of tunneling Mont Blanc is entirely practicable.—*Philadelphia News.*

A Cincinnati clergyman thought he would raise his own pork. So he bought five pigs and fattened them. Now that they are fit to kill, he says they seem so much like his own children that he hasn't the heart to kill them. The pigs are in good luck, but it's rather hard on the children.—*Boston Transcript.*

The Shell-Bearing Mollusca of Rhode Island.

[BY HORACE F. CARPENTER.]

CHAPTER VII.

GENUS SYCOTYPUS, GILL.

Shell with canaliculate suture, periostraca ciliated, nodulus instead of spinous.

Theodore Gill, M. D., in a treatise on the genus Fulgur and its allies, published in the *American Journal of Conchology*, Vol. III., pp. 141 to 152, 1867, gives a lengthy description of the genus, and his reasons for separating it from the genus Fulgur. Mr. George W. Tryon, in his latest work, *Manual of Conchology*, Vol. III., p. 142, 1881, considers it as a sub-genus of Fulgur.

8. SYCOTYPUS CANALICULATUS, LINN.

Syns.:

Murex canaliculatus, Linn.

Pyrula canaliculatus, Gld. Lam. De Kay, etc.

Busycon canaliculatus, Stimpson.

Sycotypus canaliculatus, Gill. Dall. Perkins, etc.

Shell large, thin, pear-shaped, pale fawn color, coarsely wrinkled by revolving lines; surface covered with a coarse, thick, yellowish-brown epidermis, bristling with stiff, curved hairs along the lines of growth; this epidermis easily comes off, and it is rare to find a specimen wholly covered with it; whorls six, body-whorl very large; suture a broad and deep channel, so that the upper whorls consist of two portions; an upright and a nearly horizontal one, all terminating in a pointed apex, the suture resembling a pair of circular stairs, mounting upward on the outer portion of the spire; aperture ovate, three-fourths the length of the shell; outer lip simple, sharp and arched; inner lip concave, smooth, twisted at the lower half to form a long, enameled canal; interior of aperture chestnut or fawn color, polished; operculum small, oval, semi-transparent.

This species inhabits the same localities as Fulgur carica, viz., Cape Cod to Florida, but is much more abundant in Rhode Island than carica, although never found north of the Cape. Its length is from five to seven inches, and its breadth three to four. I once found a specimen in our bay, which I presented to the Providence Franklin Society in 1872, measuring eight and one-quarter inches in length by four and one quarter in breadth.

The ova cases of this species are laid in April in a similar manner, and much resemble these of Fulgur carica; the surfaces of the cases, however, are not ribbed like that species, but are smooth, and the edges instead of being beveled to a point, are flat, and about one-eighth of an inch across, with twelve to fifteen lines across them. A string of these cases from Atlantic City, N. J., contained ninety-eight embryos in each case, making about five thousand in all.

SUB-FAMILY, BUCCININÆ.

GENUS BUCCINUM, LINNÆUS. 1767.

Shell ovate or oblong, covered with a horny epidermis; spire elevated, apex acute; aperture large, oval, emarginate in front; canal wide and short; inner lip expanded; outer lip thin, smooth internally. The genus is limited to northern seas.

9. BUCCINUM UNDATUM, LINN.

Shell thick, strong, ovate-conic, ventricose, encircled with raised lines, and with minute intervening striæ; with twelve or thirteen longitudinal obliquely waved ribs, traversing the upper whorls, fading away near the centre of the body-whorl; epidermis grayish; whorls six; aperture oval, one-half the length of the shell, white within, sometimes of a beautiful golden yellow; labium crenulated; labium broadly overlaid with callus and twisted at its lower portion; canal a mere notch. Length three inches, breadth nearly two inches.

It belongs to the Boreal Province, and is abundant and in fine condition at Portland, Me. It is not common in Rhode Island, and when found is dwarfed in size. It inhabits the ocean rocks at Newport at low-water mark and to fifty or more fathoms in depth. It is found in Newfoundland, Labrador, Greenland, Iceland, Norway, and Great Britain. The animal is very voracious, and devours immense numbers of fish. Fishes in their turn devour it with equal greediness. This species is the edible whelk of England (called Buckie in Scotland), and is collected by boat-loads, and is eaten in immense numbers when in season —August and September. They lay their eggs in October, and about two months are required for the development of the fry.

This species, like most Arctic shells, is variable in form and in size ; our New England specimens were considered by the late Dr. Wm. Stimpson to be a distinct variety from the European shells, and were named by him Buccinum undulatum. An immense number of specimens from all the various localities where this species is found, have been carefully compared, and all the so-called varieties grade into each other, so that there is no longer a doubt but our shell is the undatum of Linnæus. The name also was not well chosen, as other naturalists had previously given it to other species; thus, Buccinum undulatum is a synonym of B. Groenlandicum, Chemnitz, and B. undulatum, Moller, Hancock, is a synonym of B. Totteni, Stimpson.

Family 4. Nassidæ, contains six genera, one of which, Nassa, is represented in Rhode Island.

Genus Nassa, Lam.

Distr., about 130 species, world wide. Fossil numerous species.

Shell ovate, ventricose, body whorl variously sculptured; aperture ovate, with a short, reflected, truncated, anterior canal; inner lip smooth, often widely spread over with enamel, with a posterior callosity or a blunt, dentiform plait; outer lip dentate, internally crenulated. The genus is divided into eleven sub-genera, three of which inhabit our state. They are Phrontis, Tritria, and Ilyanassa.

Sub-Genus Phrontis, H. & A. Adams.

Spire elevated, acuminate, whorls ribbed or nodulous, distinctly shouldered; inner lip smooth, with an extended, thickened callus; outer lip with an external varix. There are eleven species, the only one of which inhabiting this country is the

10. Nassa (Phrontis) vibex, Say.

Syns:

Nassa fretensis, Perkins.
Buccinum vibex, Adams.
Nassa vibex, Say.

Shell short and thick, solid, ovate-conic : surface reticulated by twelve undulating ribs, crossed by ten elevated lines : color ashy white, olive, chocolate, or nearly black, with a pale reddish zone on the top, middle, and base of the body whorl ; spire turreted, shouldered, the border of which is nodulous ; outer lip thickened within and without, and dentate within ; inner lip concave, overspread with callus ; canal short. Length of shell, five to seven-tenths of an inch ; breadth, one-third.

This species belongs to the Southern Atlantic Province, and is found in the West Indies. It is rare even in the Middle States, but has been found as far north as Cape Cod. I have found three specimens in Coweset Bay, probably brought here on Virginia oysters.

(To be continued.)

Egg-Laying Seasons of the Genus Fulgur.

Editor of Random Notes.

Dear Sir : In Notes on the Shell-Bearing Mollusca of Rhode Island, by Mr. Carpenter, he says, in reference to *Fulgur carica*, that "the animal lays its eggs in March and April,"— leaving the reader to infer that they are not laid in any other season.

This statement is true so far as it goes, but with all deference to the gentleman, he certainly appears to have accepted the conclusions of previous authors without personal verification.

Now it is a fact, though apparently unnoticed by Professor Verrill and other eminent naturalists, that the eggs of *F. carica* and *F. canaliculata* are deposited not only in the spring and autumn months, but in all of the winter months as well; the writer having demonstrated this in part by exhibiting capsules of both species at regular meetings of the Philadelphia Academy of Natural Sciences for six consecutive months, beginning with December, 1883 ; showing on each occasion the various stages of growth, from the freshly-laid eggs to the fully developed (embryotic) mollusks.

As a record of these facts may be found in the minutes of the meetings named, there should be no reason hereafter for the repetition of an error caused, in all probability, by the lack of opportunity for continuous investigation. John Ford.

Philadelphia, Penn., June, 1884.

CONCHOLOGICAL CHECK-LIST. VII.

J. RITCHIE, JR.

Family. Cyclostomacea Pfr.
Sub-family. Cyclophorea Pfr.
Leptopoma acuminatum Sow.
acutimarginatum Sow.
apicatum Benson.
aspirans Benson.
atricapillum Sow.
barbatum Pfr.
bicolor Pfr.
caroli Dohrn.
ciliatum Sow.
ciliferum Mouss.
decipiens Pfr.
distinguendum Dohrn.
dohrni Ad. et Ang.
elatum Pfr.
fibula Sow.
goniostomum Sow.
helicoides Grateloup.
ignescens Pfr.
immaculatum Chem.
insigne Sow.
lacteum Lesson.
latelimbatum Pfr.
lowi Pfr.
luteostoma Sow.
massenæ Lesson.
mathildæ Dohrn.
melanostomum Petit.
mouhoti Pfr.
moussoni Martens.
nigricans Pfr.
panayense Sow.
pellucidum Grateloup.
perplexum Sow.
pileus Sow.
polyzonatum Moll.
pulicarium Pfr.
regulare Pfr.
rœpstorffianum Nevill.
semiclausum Pfr.
sericatum Pfr.
strangulatum Benson.
undatum Metcalf.
vitreum Lesson.

Sub-family. Pupinea Pfr.
Megalommastoma altum Sow.
alutaceum Menke.
anostoma Benson.
antillarum Sow.
Megalommastoma apertum Poey.
arboreum Cross et F.
auriculatum Orb.
bifasciatum Sow.
bituberculatum Sow.
croceum Sow.
cylindraceum Chemn.
digitale Gundlach.
funiculatum Benson.
guildingianum Pfr.
gundlachi Pfr.
lentilabrie Sow.
leonium Pfr.
mani Poey.
orbignyi Pfr.
pauperculum Sow.
procer Poey.
sectilabrum Gould.
seminudum Poey.
serotinum Adams et Sow.
sumatrense Dohrn.
tanycheilus G. Austen.
tortum Wood.
ventricosum Orb.
verruculosum Shutt.
Tomocyclus geali Cross et Fischer.
guatemalense Pfr.
simulacrum Morel.
Cataulus aurens Pfr.
austenianus Benson.
blanfordi Dohrn.
calcadensis Bedd.
cumingi Pfr.
decorus Benson.
duplicatus Pfr.
eurytrema Pfr.
gregarius H. Nevill.
hæmastomus Pfr.
layardi Gray.
leucocheilus Adams et Sow.
marginatus Pfr.
nietneri Nevill.
pyramidatus Pfr.
recurvatus Pfr.
templemani Pfr.
thwaitesi Pfr.
tortuosus Chem.
Raphaulus bombycinus Pfr.
chrysalis Pfr.
minor A. Adams.
pachysiphon Theob et Stol.

Fresh Water Aquaria.

One of the first things to be learned by the inexperienced person, in attempting to solve some of the mysteries of the rock-pool, or of the populous shades of the "submerged grove" of aquatic plants, is that of reproducing the conditions, as far as possible, under which the animals or plants flourish, that are found there; they may sometimes be found in places ill suited to their best development; observation is the best teacher here.

Some plants, as for example anacharis, or starwort, flourish best in a cool and not too sunny situation; they grow most luxuriantly in, or near, cold springs; while other plants, as milfoil, hornwort, and many other species do well, or best, in warmer situations.

So of the fishes, some species do well in water at as high a temperature as that suited to the gold-fish; while the sand-darter (*Boleosoma olmstedi*) requires, for health, a much lower temperature, and a comparatively shady place. Specimens of this interesting species can be taken at different points on the Ten-mile River; one of the largest specimens I have ever caught was taken near Dagget's Bridge, east of Pawtucket. They are to be found, also, in the other streams and some of the ponds of that vicinity. The darter is one of the queerest little fishes that can be found for the aquarium; it is from two to three inches in length, and dart-shaped; its weak fins barely enabling it to struggle to the surface for the oxygen not always in sufficient quantity at the bottom; ordinarily it rests upon some object. It spends the greater part of the time inspecting carefully the rocky recesses, or climbing over them; glides among the plants, and at every pause makes a careful survey; the flexibility of its body adding much to the effect of its movements; it turns its head to either side, changing its general position only after careful examination of the objects about it; then perhaps takes an upward look, while standing on its bent caudal extremity, mermaid-like. It is only after weeks of fruitless searching in this fashion for the crustaceans, insects, and minute fishes that, sick with long-deferred hope and gaunt with hunger, *Boleosoma olmstedi* finally takes the unaccustomed proffered food from the hand. S.

Providence.

Wild Roses.

Fair June is at her best when the wild roses open their blossoms to the sunlight. When the meadows are bespangled with daisies and buttercups, and the bees hum about the clover tops, we love to wade knee-deep in the billowy grass upon which these beauties seem to float. It is then that the sweet wild roses which gather about the stone walls of New England come quietly into bloom. It is peculiarly inappropriate to say of them that they *burst* into flower. Creatures so gentle have not so demonstrative an evolution. All their movements are like their outlines, graceful. The colors are the highest and most delicate conceivable; an embodied blush, a sunrise glow enshrined. The perfume is as sweet as the memory of the loved and lost. It is not overpowering, but pervasive, subtle, and delicious. In the season of the roses we keep a cluster of these native blossoms, the full-blown flowers and the opening buds, upon our table. They hallow our thoughts and make us at peace with all men. They are as transient as all things that we prize. Hardly can one say, how admirable, when the petals fall upon our paper. With the splendid mountain-laurel, they are commencement flowers, opening into loveliness at the time when the young graduate goes forth into real life. Yet how different are they from the superb shrub that makes glad our highways and smiles over the ashes of the dead! The Kalmia is a type of mature and thoughtful summer; the rose of spring's later days. For our spring is not confined to May. If we possess such a season at all, it is in June.

We do not underrate the roses of the garden when we express our delight in their unpretending field relatives. The undoubled flower, as nature designed it, is dearer to us than the long-prized and modified horticultural favorites. In the early morning when the dew beads its wondrous petals, we seek the rose as a part of our devotion. Surely no sweeter incense rises to the throne of God! W. Whitman Bailey.

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7	06	50	02	12	35
8	07	60	02	14	40
9	08	70	03	16	50
10	09	80	03	18	70
11	10	90	04	20	80
12	12	1 00	04	22	1 05
13	14	1 20	04	25	1 20
14	17	1 50	05	35	1 40
15	19	1 70	06	45	1 60
16	20	1 90	07	50	1 90
17	23	2 10	08	60	
18	26	2 30	09	70	
19	28	2 50	11	85	
20	32	3 00	14	1 10	
21	40	3 50	18	1 20	
22	50	4 50	20	1 50	
23	60	5 25	22	1 75	
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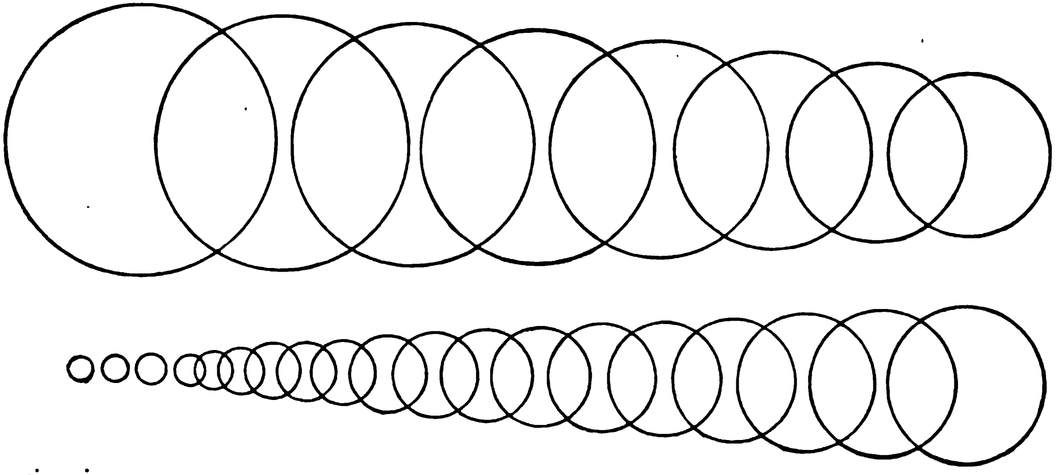

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6	8 "
7	9 "
8	10 "
9	11 "
10	13 "
11	14 "
12	15 "
13	16 "
14	17 "
15	18 "
16	20 "
17	22 "
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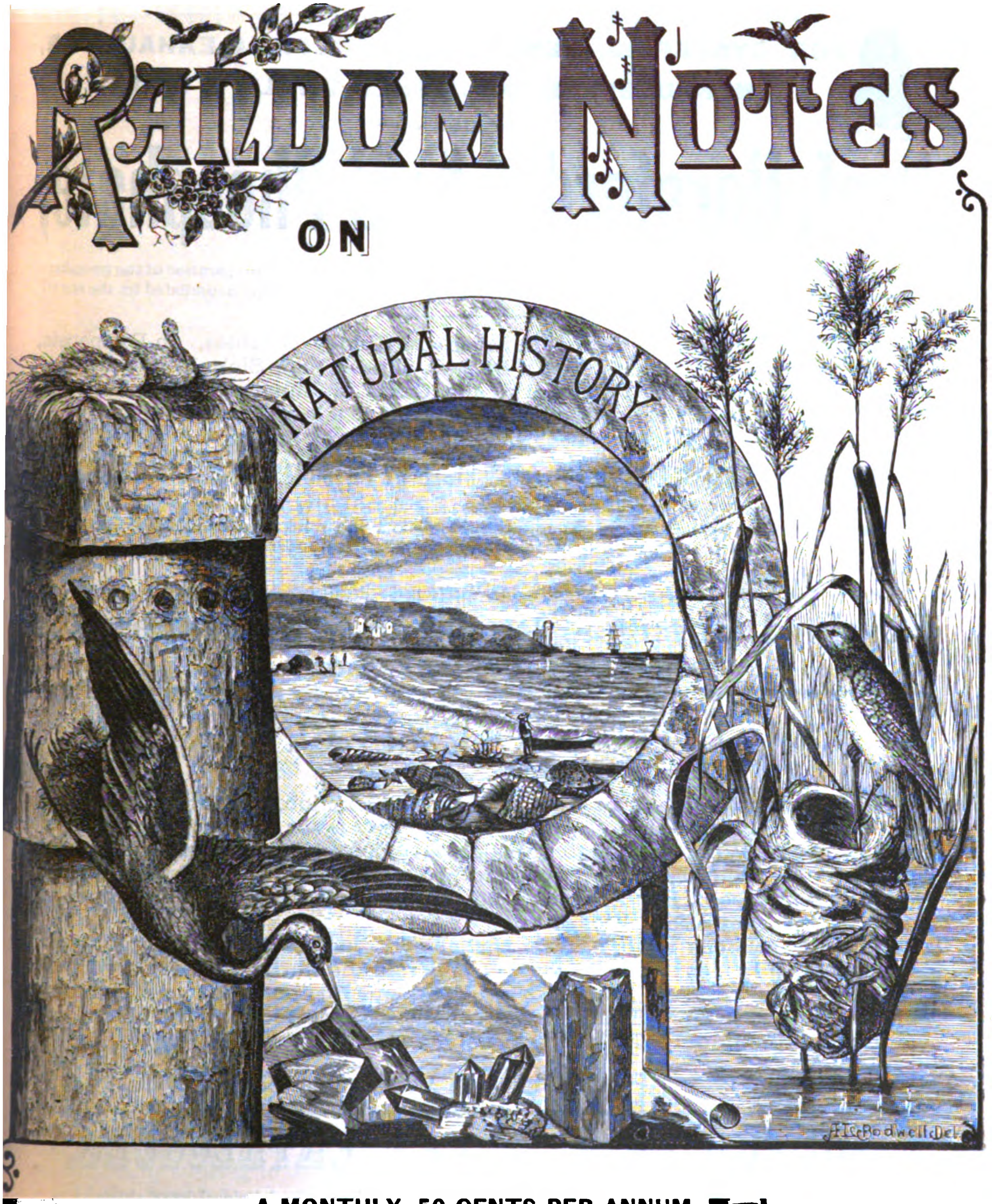

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SPECIAL NOTICE.

SUBSCRIPTIONS hereafter will begin with the current number, or the March number if desired.

MR. FREDERIC A. LUCAS, secretary of the Society of American Taxidermists, kindly volunteers his services to aid our taxidermist department. Mr. Lucas has made a specialty of mounting reptiles, the turtles being favorites.

THE Handbook of the St. Nicholas Agassiz Association, by Mr. H. H. Ballard has recently appeared. It gives the history of that organization, and full instructions to aid its members in their work. A few statements under " How to collect and preserve birds " will be liable to give the amateur trouble. The author would have done well to have left out where the best places to find birds are, for each bird chooses situations suited to its habits, and to collect a large variety as varied country as possible should be visited.

We would advise not using any hook, as with a little experience it can be readily dispensed with, and a saving of time gained. With its use large birds may be handled more easily, but in the case of small birds the fingers soon learn how to clasp the body so that the feathers will give no trouble by sticking to the meat.

"If the head is too large, . . an incision must be made under the throat which can afterward be sewed." This is all wrong; *never* cut a bird under the throat, but instead *open it on the back of head.*

The further statement after poisoning of, "turn it (the skin) right side out and allow it to become perfectly dry." After this he would have the plumage smoothed out and the bird made into a skin. *This is impossible.* The bird must be made into a skin while moist, when dry nothing can be done with it.

Our bird catalogue gives a much better method for making bird skins, and if any of our statements are not clear, or if there are any points about taxidermy which our readers would like explained we invite them to write for an explanation. We are also willing to assist members of the Agassiz Association on this subject. The editors of RANDOM NOTES also wish instructive articles on taxidermy from any who are interested in the art.

THE Third Annual Report of the Society of American Taxidermists is now in the binder's hands and will soon be ready for delivery to the members. It forms a book of 128 pages with two heliotype plates, and contains a full account of the New York meeting of 1883, with all the addresses and papers then read. The Society is making steady progress and is continually adding to the number of its members. A meeting will soon be held for the election of new members, and for the purpose of discussing the date for the next exhibition.

Valuable Notes from Vermont.

SEVERAL months ago Mr. C. W. Graham mentioned incidentally in a letter to us, the capture of a Scissor-tailed Flycatcher, *Milvulus forficatus.* In response to a query for particulars he writes: "Am sorry I can't give a real nice story about the Scissor-tail. Can't find the memorandum made of it anywhere. All I can tell now is I ran across the fairy while hunting cedar birds, and followed it, thinking it was a partial albino cuckoo. When we took it in, it proved a genuine Scissor-tail, and now reposes in Dartmouth College. Can't tell the date for the life of me. If I had time I'd make a yarn worth reading, but as it is I

The Arctic Fox — Vulpes logopus, Linn.

Occasionally we find among the stocks of the furriers, skins of this beautiful little fox in winter pelage of snowy white. Just at present they are in much esteem, for the making of mats, the head being stuffed to shape, and the skin spread to its full extent. It is also reported that thousands of their skins are imported into China, as trimmings for the dress of the mandarins. The animal does not occur in the United States, but from Labrador northward, inhabiting the Arctic portions of both continents, also Iceland and Greenland. The fur is long and dense (almost downy), covering even the soles of the feet, and the tail is very full and round; the ears are short and erect, and the head short and more dog-like than with other foxes. The summer pelage is said to be a bluish or leaden gray. During the summer they burrow in colonies, some twenty or thirty together, or when quite undisturbed are often satisfied with the shelter of a rock, and develop eight or ten young at a time. Their food is small mammals, birds, and matters thrown upon the shore by the waves, in fact, what they can get, the locality does not offer much variety. *La Nature* says they enter with astonishing boldness the encampments of travelers, and seize not only provisions, but covering, and woolen and skin clothing. The naturalist Stella and his companions were cast by shipwreck upon Behring's Island, and for ten months suffered much from such incursions. They fired at them, set traps, and capturing a few individuals exposed them to the eyes of their companions, but every night the foxes returned, stole provisions, and gnawed gloves, shoes, hats, and even their reindeer-skin bedding. Their capture presents no difficulty, as their instinct for self-preservation is poorly developed; they are a singular mixture of boldness and cowardice, stupidity and cunning.

The Ostiaks Saymoyeds, when the ground is covered with a winding-sheet of snow in winter, start upon a campaign, armed with shovels made from reindeer-antlers. As soon as they discover the mouth of a burrow dug through the snow, they ascertain its direction, open the gallery with their shovels, seize the semi-torpid animal by the tail, and dash its brains out against a rock.

Mr. P. L. Martin estimates the number of skins that annually reach the markets of Europe at 90,000, others come to the United States, and under the existing circumstances, the species is sure to soon become extinct. The Arctic fox when captured young is easily tamed, and two individuals of this species are now confined at the *Jardin des Plantes* in Paris.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

Few branches of Rhode Island natural history have received less attention than its herpetology. Whether this arises from the instinctive aversion held by the majority of people for anything that "crawls," or from the numerous difficulties that are met in collecting data, may be a question. The present need, however, of a catalogue, and the fact that our Reptiles and Batrachians are daily becoming fewer, has prompted the writer to at once compile such facts as are or may be known; soliciting special aid from the readers of Random Notes. It seems that by thus bringing together points of interest, either in habit or special distribution, from so considerable a source, the generalizations cannot but be valuable. Such communications, as well as remarkable specimens—the latter will be especially desirable — should be left with the editor. Specimens thus deposited, with full data, will, if of sufficient interest, be preserved and added to the Museum of Brown University, where they will form a permanent, typical state collection.

That all interested may be able to lend an helping hand to advantage, the following articles will include the synonomy, and a description of the several types which are likely to be found inhabiting the state, to which will be appended, with due credit, such notes as have been submitted. Finally, when the several types have been treated, a summary and check-list will conclude the series.

Reptiles, Batrachians, and Fishes were formerly included under the more general term "cold-blooded vertebrates," in distinction from the birds and mammals provided with appreciably warm blood. That the distinction is somewhat erroneous is evident from an insight into the nature of heat production. No one, but all organs have to do with heat production, which is directly brought about by motion and oxidation; a slow combustion disposing of organic waste. In the "warm-blooded" animals the circulatory system is so constructed as to keep the venous, charged with carbon and other impurities, separate from the pure arterial blood. This impure blood is not only purified in the lungs, but carries with it, to the different tissues, no small amount of oxygen. Considerable heat, brought about by the chemical union of oxygen and carbon, is thus produced not only in the lungs but throughout the body. In the "cold-blooded" vertebrates the heart mixes arterial and venous blood, thus sending to the lungs or gills, or both lungs and gills, as the case may be, blood that is only partially charged with impure matter; the resulting oxidation must hence be slow and the heat produced of a low degree. The amount of heat is further reduced in those forms breathing by means of gills, by the comparatively small amount of oxygen in the water. It must not be thought, however, that the lungs alone are the heat producers; the several organs of the body assist, as well as all physical movement, the sum total resulting in a "warm" or "cold-blooded" animal, as the case may be.

Reptiles, which are represented in Rhode Island by turtles, lizards, and snakes, differ from the Batrachians, toads, frogs, salamanders, and newts, in several particulars. While reptiles are hatched or born in form and structure differing from the adult only in respect to size, the immature Batrachians are strikingly unlike the adult; in their mode of breathing and progression much more resembling fishes, from which they reach the mature form through a succession of metamorphoses. A second, and possibly a more obvious distinction, is in the dermal covering; all our Reptiles being protected by scale-like folds of skin, while the Batrachians are without this means of protection, having the skin moist and pliable.

In members of both classes intelligence is of an extremely low order, one or more of the special sense organs is often atrophied. Growth is slow and often continuous through life, which is often greatly protracted. From an economic standpoint both Reptiles and Batrachians form important checks against the undue increase of destructive vermin, and the flesh of turtles, some lizards, and many Batrachians is an important addition to the table. Confining our attention to such Reptiles as may be found in our locality, we find representatives of three orders: Testudinata, Sauria, and Ophidia.

The first order includes the turtles and tortoises; animals with keen sight, rather acute hearing, but with smell and taste somewhat dull. All turtles are oviparous, depositing the eggs, which are fertilized in the oviducts, in sand to be hatched by solar heat. The males are externally distinguished from the females by having a concave *plastron* (the lower portion of the shell), and some of the sea-turtles are provided with stout hooks on the fore flippers.

The second order, Sauria, including the lizards, is with difficulty separated, because of some of its representatives, from the third. The only form likely to be captured in Rhode Island, however, shows few ophidian tendencies.

The third, and last order of Rhode Island Reptiles, includes the snakes, under the term Ophidia. The snakes have keen sight; except just previous to the time of moulting, when the cleaving epiderm, which covers the eyes, renders them partially blind. The sense of smell is probably well developed, judging from the strong odor given off by many species during the breeding season. Hearing is dull, and no external ears are to be seen. Taste is probably wanting, the tongue being used as a tactile organ. Though some foreign snakes incubate their eggs, our species, if oviparous, leave them to care for themselves much as do the turtles. Some of our forms, however, are viviparous.

The facts do not warrant the popular belief that the young, in time of danger, seek safety by allowing the parent to swallow them. Nor is it true that the snake covers its prey with slime previous to deglutition. Intelligent people need not be cautioned against crediting the oft-heard stories of "charming," and of "hoop-snakes." The ready, but fallacious, method of determining the Rattler's age by adding three to the number of rattles, has became so securely the property of newspaper reporters as to banish all hope for more truthful things.

JET.

THE mineral itself is nothing more or less than a species of pitch coal, found in detached masses, grained like wood, splitting horizontally, light, and moderately hard. It is often confounded with "cannel" coal, but it is quite distinct. Cannel coal is much harder than jet, has no grain, and splits in any direction. Jet is not easily fused, and requires a moderately strong heat, burning with a fine, greenish-white flame, and emitting a bituminous smell. The particular value of jet is, of course, its susceptibility for taking on fine polish. Jet abounds more or less all over the world. In England it is found in greatest quantities in the neighborhood of Whitby, in Yorkshire. There it is mixed with bituminized wood, and coniferous trees in the upper lias or alum shale of the district. In Prussia it occurs in association with amber, and is named by the amber-diggers "black amber," a phrase which seems to have traveled to Italy, for the mineral is there sometimes called "amber nera." This term is more applicable from the fact, that jet, like amber, becomes electrical by friction. There is a belief that amber and jet come from one source; that amber is a fossil gum, while jet is the trunks and branches of the trees more completely bituminized, and freer from earthy impurities than cannel or other coal. Indeed, M. Magellan goes so far as to say that jet is a pure amber, differing only in color from the undisputed variety. In France large quantities are found in the department of the Aude, where a large number of artisans find steady employment in fashioning it into rosaries, religious beads, and ornamental trinkets, when fashion demands them.

In Spain jet of a very high quality is found at Villaviciosa, in the province of Asturias, and is manufactured principally at Oviedo. But during the present century jet became a popular ornament, and now, probably in not a few minds, Whitby and jet are inseparably associated. The article acquired considerable value, and some twenty years ago jet ear-rings ranged in value from 5s. to 30s. a pair. Then a lucrative trade was carried on at Whitby, jet miners scooped out pits in the pretty Cleveland Hills, and a large number of men and young women in Whitby found employment in carving the precious coal into articles of feminine ornament. But the success of the English jet trade brought competition into the field, and with it imitation, which latter first demolished the genuine jet trade, and then committed suicide.—*Popular Science Monthly.*

Historical Trees of Rhode Island.

CONTINUED.

SOME of the most remarkable elm trees in the city of Providence are the following: In the northern and oldest part of the city are three grand elms, triangularly situated, one at the junction of North Main Street and Branch Avenue, 12 feet 11 inches in circumference; its exact age is not known. The great gale of September 23, 1815, blew off one of the prominent branches and split the trunk, which subsequently was secured by an iron bolt, which now lies entirely imbedded in the tree. The second elm, 13 feet 6 inches in circumference, is near the Dickey House, on Branch Avenue. The third one, 12 feet 9 inches in circumference, is located in Abbott's lane, on the site of the oldest house in the municipality. These last two are estimated to be 150 years old, and it has been noticed of late years, that these trees annually increase one inch.

On the eastern hillside of the city of Providence in Congdon Street, at the entrance of Prospect Terrace, and near the spot where Roger Williams is credited a burial, is a very ancient elm, well preserved, with large spreading branches. The late venerable William Wilkinson thirty years ago said that when he was a boy this tree was then aged. It is safe to say its age is more than two hundred years.

In the city, at Elm grove, an elm tree south of the pond girths, at four feet from the ground, 14 feet 5 inches; another, west of the pond, 12 feet 5 inches. On Admiral Street, in front of the old residence of Commodore Esek Hopkins, is a fine spreading elm of 11 feet girth, planted by his daughter in 1786. In Pawtucket an elm on Main Street, measuring 17 feet in circumference, has recently been removed. Over the city limits on Plainfield Street, in Johnston, are three elms, girth five feet from the ground, about sixteen feet. These trees were probably set out in 1748. J. H. B.

Providence Journal.

(To be continued.)

Remarks on the Omission of Certain Species of Shells in Previous Papers on the Shell-Bearing Mollusca of Rhode Island.

[BY HORACE F. CARPENTER.]

In a letter to the editors of Random Notes Prof. A. E. Verrill says: "I judge that the writer on shells in your journal is unacquainted with my paper (1881)," describing new species of shells found in New England waters, and "he also seems to be unaware that the United States Fish Commission spent the summer of 1880 at Newport, and dredged extensively in Narragansett Bay and all the other waters of the State of Rhode Island, and that accounts of these operations have been published." These remarks were probably made on account of the omission of certain new species described in the works referred to, and on this account, and that this charge may not be brought up again by others, I omit the regular paper this month, to explain the reason of the omission of these new species in their proper places in previous papers.

I am not ignorant of the existence of these publications, as I have before me the "Report upon the Invertebrate Animals of Vineyard Sound and Adjacent Waters," by A. E. Verrill and S. I. Smith, published in 1874, the same being extracted from Prof. S. F. Baird's Fish Commissioners' report; also the "Catalogue of Marine Mollusca, added to the fauna of New England during the past ten years," by A. E. Verrill, taken from the "Transactions of the Conn. Acad.," from April to July, 1882; and the "Second Catalogue of Mollusca recently added to the fauna of New England," by A. E. Verrill, also taken from the "Transactions of the Conn. Acad.," April to July, 1884. The first-mentioned volume is just what it represents itself to be by its title and needs no comment; due mention is made in my papers of all species described in it; the second includes within its pages the shells found from Nova Scotia and New Brunswick to the Gulf Stream, off the southern coasts of New England, embracing all depths down to 600 fathoms, while the third mentions but three species belonging to Rhode Island, and extends its range to Cape Hatteras, and in depth to 2,000 fathoms. There have been quite a number of new species added to the fauna of New England, but I have never seen a specimen of one of them, and am not very liable to, for although suites of specimens of these shells have been presented to public museums and societies of natural history, and in some cases to societies dead and fossilized years ago, who have no members who know or care anything about them, and where these specimens are laid away as useless material, private individuals who might be benefited by them, cannot get them for love or money. I have tried many times to obtain specimens of these shells for study, but without success.

The papers on "The Shell-Bearing Mollusca of Rhode Island," were not intended to cover the whole coast of the United States, or even of New England, but simply those forms which have been, or are liable to be, found within the limits of our own little state. I ask the reader if those shells which have been found only to the north, or to the south of us, or those dredged from 500 to 10,000 feet, 50 or 100 miles from shore, belong to the fauna of Rhode Island, or to the deep-sea fauna of the Atlantic Ocean.

I have thus far described the species belonging to the first eleven families of the class Gasteropoda which inhabit our state. I will now notice in their proper order, those species referred to in the above works, which were not mentioned in the previous papers on "The Shell-Bearing Mollusca of Rhode Island," and in future will take care not to leave any loop-hole of this kind open for comment. I give the species and the distribution geographically, but without description, as that would occupy too much space, and refer the reader to the original works.

Family 1. Muricidæ.

See Random Notes, No. 5, p. 9.

Sub-family 1. Muricinæ.

Genus Trophon, Montfort.

Trophon clathratus, var. Gunneri. (Loven.)

Dist., Greenland, Iceland, Nova Zembla, etc., etc.

Trophon Fabricii, Möller.

Dist., Gulf of St. Lawrence, Davis Straits.

Trophon Lintonii, Verrill & Smith, Mss.

One specimen only was dredged off Martha's Vineyard in 70 fathoms in 1882. It was named for Prof. E. Linton, a member of the Fish Commission parties of 1882 and 1883. A description of this shell will be found in Am. Jour. Sci., Vol. xxiv, p. 365, 1882. No other specimen has ever been discovered, to my knowledge, at least. Is it entitled to a place among the shell-bearing mollusca of R. I.?

FAMILY 4. BUCCINIDÆ.

See RANDOM NOTES, No. 6, p. 8.

Sub-family 2. Neptuninæ.
Genus Neptunea, Bolten.
Sub-genus Volutopsis, Mörch.
Volutopsis Norvegicus, Chem.

Dist., Newfoundland, Greenland, Iceland, Norway, Alaska, etc., etc.

GENUS SIPHO, KLEIN.

Sipho pubescens, Verrill, sp. nov. Cat. Mar. Moll., 1882, p. 501. Described by Verrill as Neptunea propinqua, Am. Jour. Sci., xvi, 210, 1878. Also, ib. xx., 391, 1880. Proc. U. S. Mus., iii., 370, 1880. Inhabits deep water off Cape Sable to Chesapeake Bay. A number of specimens were dredged off Martha's Vineyard in 86 to 410 fathoms.

SIPHO SABINII, GRAY, 1824.

Two specimens from Cashe's Ledge, Maine.

Sipho parvus, Verrill & Smith, sp. nov. Cat. Mar. Moll., 1882, p. 504. Fourteen specimens dredged off Martha's Vineyard in 312 to 506 fathoms.

Sipho glyptus, Verrill, sp. nov. Cat. Mar. Moll., 1882, p. 505. Off Martha's Vineyard in 219 to 458 fathoms.

Sipho caelatus, Verrill & Smith, Proc. U. S. Mus., iii., 369, 1880. Off Martha's Vineyard and Newport, R. I., in 238 to 500 fathoms.

Still other species of Sipho are described in the second Cat. of Moll., 1884, from deep-sea dredging as deep as 2000 fathoms, viz.: obesus, profundicola and var. dispar, caelatus, var. hebes, caelatulus, simplex and leptalæus, the latter off Martha's Vineyard. *One* specimen only was found in soft mud in 452 fathoms. Do these shells belong to our fauna?

SUB-FAMILY 4. BUCCININÆ.

GENUS BUCCINUM, LINN.

Buccinum Sandersonii, Verrill, sp. nov. Cat. Mar. Moll., 1882, p. 490. Named for Mr. Sanderson Smith, of the U. S. Fish Commission. Three specimens were dredged off Martha's Vineyard in 258 fathoms. The other species described are Buccinum cyaneum, var. perdix., Cape Sable, Halifax, Gulf of St. Lawrence. Buccinum tenue, Gray, same localities. Tottenii, Stimpson, Newfoundland, Spitzbergen; and a few others from similar localities.

FAMILY 5. NASSIDÆ.

See RANDOM NOTES, No. 7, p. 8.

Genus Nassa, Lamarck.

Nassa nigrolabra, Verrill. Proc. U. S. Mus., iii., p. 371, 1880.

One specimen dredged off Martha's Vineyard in 155 fathoms, and referred to Nassa provisionally. The animal is not known.

FAMILY 9. MARGINELLIDÆ.

See RANDOM NOTES, No. 8, p. 8.

Genus Marginella, Lam.

Marginella borealis, Verrill, sp. nov. Second Cat. Moll., 165, 1884.

A few *dead* specimens were dredged off Martha's Vineyard in 65 to 100 fathoms. It inhabits the warm waters of the Gulf Stream, and is a strictly tropical or subtropical genus. Why should we call these Rhode Island shells?

FAMILY 11. COLUMBELLIDÆ.

Genus Columbella, Lam.
Sub-genus Anachis, H. and A. Adams.
Anachis costulata, Cantraine.

Dist., Norway, England, Nova Scotia, Chesapeake Bay, etc. Dredged off Newport in 1880 and 1881 in 146 to 506 fathoms, (3,000 feet deep).

Anachis similis, Verrill. Rep. Invert. An., 1874.

Syns.:

Columbella similis, Ravenel. Proc. Ac. Nat. Sci., Phila. 41, 1861.

Columbella avara (in part) Gould. Invert. Mass.

This species (avara) is described in RANDOM NOTES, No. 9, p. 7. It varies very much in form, sculpture, and color. Verrill called the long and narrow varieties, similis, and the others, avara. Other authorities, having large quantities of specimens from Massachusetts to Florida, have decided that they are all one species, and that one avara. I leave the subject here without further remarks.

CONCHOLOGICAL CHECK-LIST. X.

J. RITCHIE, JR.

Family. Cyclostomacea Pfr.
Sub-family. Cyclostomea Pfr.
Cyclostomus dissectus Sow.
dominicensis Pfr.
elegans Müll.
encausticus Reeve.
enchilus Pfr.
fasicularis Pfr.
filostratus Sow.
fimbriatus Lam.
formosus Sow.
fulvescens Sow.
fusculus Pfr.
glaucus Sow.
goudotianus Sow.
griseus Pfr.
habichi Weinl.
hartwigianus Pfr.
heynemanni Pfr.
humphreysianus Pfr.
hydeii Weinl.
ictericus Sow.
insularis Pfr.
interruptus Robill.
jayanus C. B. Adams.
kraussianus Pfr.
lævigatus Webb.
lamellosus C. B. Adams.
lave Pfr.
levis Pfr.
lienardi Morel.
ligatulus Grateloup.
ligatus Müll.
lineatus Pfr.
macareæ Petit.
madagascariensis Gray.
mauritianus H. Adams.
melitensis Sow.
michaudi Grateloup.
modestus Petit.
moniliatus Morel.
moulinsii Grateloup.
multifasciatus Grateloup.
nov-hiberniæ Quoy.
obsoletus Lam.
occlusus Mörch.
Cyclostomus olivieri Sow.
parvispirus Pfr.
pulchellus Sow.
pulcher Gray.
pyrostomus Sow.
rangelinus Poey.
rectus Gundlach.
redfieldianus C. B. Adams.
reticulatus Adams et Reeve.
retrorsus C. B. Adams.
rollei Weinl.
rugosus Lam.
rugulosus C. B. Adams.
saccatus Pfr.
salebrosus Morel.
sarcodes Pfr.
saxorum Weinl.
sericinum C. B. Adams.
seychellense Nevill.
solidus Menke.
sowerbyi Pfr.
striatulus Pfr.
subliratus Pfr.
suffusus Sow.
sulcatus Lam.
tectilabris C. B. Adams.
tenuis Sow.
tersus Benson.
thysanoraphe Sow.
tricarinatus Müll.
trochlea Benson.
undulatus Sow.
undulosus Sow.
unicarinatus Lam.
unicolor Pfr.
vesconis Morel.
vexillum Sow.
virgatus Sow.
vittatus Sow.
voltzianum Mich.
wilkinsoni C. B. Adams.
xanthocheilus Sow.
yallahensis C. B. Adams.
zanguebaricus Petit.
zonatus Petit.
zonulatus Petit.

The Beginning of Autumn.

In these first days of autumn the woods are peculiarly attractive. Especially is this so if, as has occurred this summer, the season has been a wet one. Then do we see the foliage in all its maturity of perfection, and the gorgeous flowers of the month with added beauty. These flowers, indeed, are the choicest of the year. Most glorious of all is the cardinal flower. This can still be found within our city limits; there are few large towns of which this can be said. This truly regal, or should we say ecclesiastical, plant is best seen along some shady forest brook. Long lines of scarlet spikes then stand like British soldiers disputing passage. They wear the real cardinal red, and that much-abused adjective splendid, is to them perfectly applicable. How the original discoverer must have jumped for joy, for such a manifestation is not incompatible with true scientific sobriety.

Now is the time when the amber pendants of the barberry are transmuted into coral necklaces. Nothing can be more beautiful than the barberry from its flowering to its fruition. It is one of those natural objects that we can never pass without a tribute of praise.

Asters, those stars of the West, are now beginning to open, and they are infinite in variety and size. Their colors are blue and white with shades between. With them come golden-rods, all of them but one yellow, and like the asters, of numberless species and choice habit. When people speak of "*the* golden-rod" as if there was but one, it makes the old student smile. Let those interested in asters and golden-rods consult the new part, just out, of Gray's masterly *Synoptical Flora of North America*. In it these difficult genera have been reëlaborated with utmost skill and care. Other striking wild flowers of the season are the turtle head (*Chelone*), and the indigo-blue gentian, its blossoms closed upon some secret. As a matter of fact, however, it is visited by insects. The monkey-flower (*Mimulus*) growing in moist grounds, is a very pretty, graceful plant, well worthy of garden cultivation. So are many of the *Gerardios*, did not their partially parasitic habit exclude them. The copses still show the white rareness of clethra, and the sumacs are reddening their pompons of fruit. Tinges of color, here and there, on trees or shrubs, the purpling foliage of Elodes, and the yellowing of milk-weeds, show the approach of autumn. So do the rich, ink-filled berries of the poke or garget, a most elegant plant.

One who saunters with his eyes open can at all seasons perceive and comment. The exuberance of the perfected year now especially tempts the wood-lover. Beauty lies all around him. There is lavish display of color and form. Let us enjoy to the full what will soon be withdrawn.

W. W. B.

August 30, 1884.

An Enterprising Janitor: — A gentleman recently gave the janitor of ——— Building in this city, a quantity of ammunition, a large portion of which was loaded paper shells. The brass ends of the cartridges looked so valuable to this janitor, that he carefully cut away the paper, emptying the powder into one receptacle and the shot into another, for the sake of the ends to sell for old brass. His idea of the value of the contents may be gathered from the fact that at the end of the tedious operation he sold three pounds of powder and nine pounds of shot for thirty cents, and asked his customer if he thought that price too much.

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38.	Plain Titmouse. *Lophophanes inornatus.* [287.]	75	1 00		
50.	Yellow-headed Tit. *Auriparus flaviceps.* [300.]	1 25	1 50		
51*a*.	Slender-billed Nuthatch. *Sitta carolinensis aculeata.* [278.]	45	60		
54.	Pigmy Nuthatch. *Sitta pygmæa.* [281.]	60	85		
56.	Cactus Wren. *Campylorhynchus brunneicapillus.* [262.]	75	1 00	30	25
63*a*.	Western House Wren. *Troglodytes aedon parkmanni.* [271.]	45	60	15	10
105.	Black-throated Gray Warbler. *Dendrœca nigrescens.* [192.]	1 25	1 50		
141*b*.	Plumbeous Vireo. *Lanivireo solitarius plumbeus*	1 00	1 25		
182.	Green-backed Goldfinch. *Astragalinus psaltria.* [314.]	40	60	30	25
204*a*.	Western Lark Finch. *Chondestes grammica strigata*	60	75	30	25
207*a*.	Intermediate White-crowned Sparrow. *Zonotrichia gambeli intermedia*	45	60	30	25
208.	Golden-crowned Sparrow. *Zonotrichia coronata.* [347.]	50	75		
211*a*.	Western Chipping Sparrow. *Spizella domestica arizonæ*	50	75	30	25
216.	White-winged Snowbird. *Junco aikeni*	75	1 00		
219.	Pink-sided Snowbird. *Junco annectens*	75	1 00		
220.	Gray-headed Snowbird. *Junco caniceps.* [353.]	1 00	1 25		
225*a*.	Sagebrush Sparrow. *Amphispiza belli nevadensis*	1 50	2 00		
231*c*.	Californian Song Sparrow. *Melospiza fasciata samuelis.* [343, 365.]	45	60	15	10
238*a*.	Spurred Towhee. *Pipilo maculatus megalonyx.* [394.]	60	75	40	35
245.	Black-headed Grosbeak. *Zamelodia melanocephala.* [381.]	50	75	25	20
260.	Yellow-headed Blackbird. *Xanthocephalus icterocephalus.* [404.]	♂ 50 ♀ 40	65 50	20	15
261*a*.	Red-and-black-shouldered Blackbird. *Agelæus phœniceus gubernator.* [402.]	45	65	15	10
262.	Red-and-white-shouldered Blackbird. *Agelæus tricolor.* [403.]	1 00	1 25		
264.	Western Meadow Lark. *Sturnella neglecta.* [407.]	50	65	20	15
269.	Hooded Oriole. *Icterus cucullatus.* [413.]	1 00	1 25	1 00	90
272.	Bullock's Oriole. *Icterus bullocki.* [416.]	50	75	25	20

293.	California Jay. *Aphelocoma californica.* [437.]	65	85	30	25
307.	Cassin's Kingbird. *Tyrannus vociferans.* [127.]	1 50	2 00		
338.	Anna's Hummingbird. *Calypte annœ.* [105.]	75	1 00	60*	60
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350.	Black Swift. *Cypseloides niger borealis.* [108.]		6 00		
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368*a*.	Striped-backed Three-toed Woodpecker. *Picoides tridactylus dorsalis.* [84.]	2 50	3 00		
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394.	American Barn Owl. *Aluco flammeus americanus.* [47.]	2 50	3 50	75	65
408.	Burrowing Owl. *Speotyto cunicularia hypogœa.* [58, 59.]	1 00	1 50	60	50
448.	Ferruginous Rough-leg. *Archibuteo ferrugineus.* [32.]	5 00	6 00		
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761.	Pigeon Guillemot. *Uria columba.* [727.]	2 00	2 50	50	40
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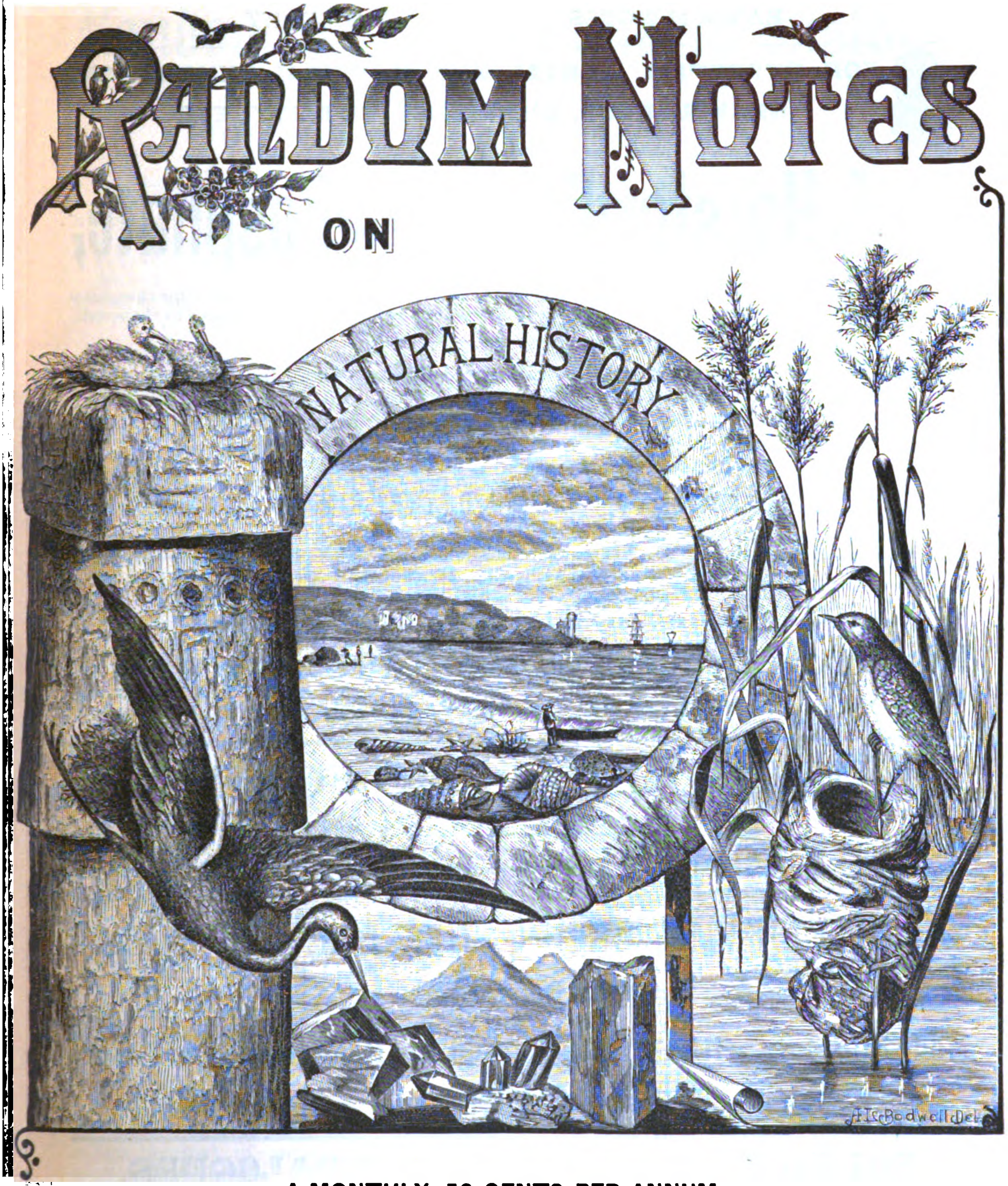

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Random Notes on Natural History.

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Random Notes on Natural History.

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What Is the Buffalo Moth?

Many articles have appeared in the columns of the daily newspapers, and in magazines devoted wholly or in part to science, and still there is a constant inquiry as to " What is the Buffalo Moth, or Buffalo Bug? "

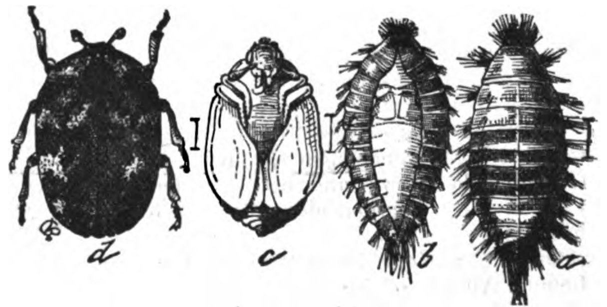
The name carries dismay into the heart of the good housewife, who, having heard that such a creature exists among us, is tormented by reasonable fears and visions of carpets and drapery destroyed.

It is not a moth at all; the larvæ (commonly and incorrectly called worms) of certain small moths, *Tinæ tapelzella*, *Linn.*, do eat carpets, but the creature now under consideration does not have soft and feathery wings like a moth or butterfly, but is a beetle about 0.08 of an inch in length, and two-thirds as broad, hard to the touch, and in color a mixture of rusty black, dull red and white; running rapidly or drawing up his legs snugly and feigning death. Crush him whenever found, but look out still more carefully for the larva, which is 0.25 of an inch long, oval in shape, and covered with long, brown hairs. The insect works much more destruction in this state than when perfected to the beetle. These larvæ are said to moult very frequently, and the cast-off skins, split open on the back, are to be found lying about the fields of their depredations.

Benzine is in general, if applied in liberal quantity and for a considerable length of time, fatal to them, but its proper application to our heavy carpets and large rooms is hardly possible, its inflammability being an objection. If carpets were not tacked down, and the edges were frequently turned over and swept, it would do some good; as these pests, like all others of similar habits, are best pleased to work in quietness and in the dark. Therefore shake often, and give to the light, woolen clothing, fur rugs, feather dusters, and the bunches of peacock feathers now so much in vogue for home decoration.

Waxed or oiled floors may be covered with rugs that can be frequently taken up, and that fashion has been forced upon our European brethren by this and other carpet-destroying insects.

The name is *Anthrenus scrofulariæ*, and they belong with the same group of *cole-*



Anthrenus scrofulariæ.

a, *b*, larvæ; *c*, pupa; *d*, imago.

optera as the bacon-beetle and several others, all well known with sorrow by most collectors of botanical and zoölogical specimens.

Mr. George Dimmock states, *Standard Natural History, Part 25, page 379,* that this buffalo-bug or carpet-beetle, like other species of *Anthrenus,* is found out-of-doors, upon the pollen of plants, and often in swarms upon flowers of the different kinds of *Spiræa.* and upon those of the shad bush, *Amelanchier canadensis.*

Historical Trees of Rhode Island.

Concluded.

In the town of Warwick, on the place known as the Moses Lippitt farm, south of the head of Conimicut Point, is a linden tree of noble proportions. Its place of subdivision is about nine feet from the ground. The girth at three and one-half feet up is 21 feet; spread of branches, about thirty feet.

The white ash which grew at Apponaug, in the town of Warwick, behind the town hall, was one of the largest known. Its circumference did not vary much in the columnar trunk, which was nearly as large horizontally as vertically. Girth at two feet up, 14 feet; three feet up, 13 feet 8 inches; four feet up, 13 feet 9 inches. At five feet up it abruptly diverges into a very spreading head, making at first three main divisions with considerable space between them, these divisions speedily breaking up into numerous small branches. Its spread toward the SSE. is 35 feet; less in the other direction. The tree is, say 60 feet high. There has been much decay from water oozing down into the trunk. The bark is ashy gray, less fissured in the trunk than that of an elm equally large; on medium-sized branches smooth with longitudinal splits, as in a chestnut; it was often thickly laden with samara.

There is a sassafras tree in this town whose circumference near the ground is 14 feet 3 inches, two and one half feet up 12 feet, and it is about eleven feet up to the branches.

On the ancient homestead of the late Lemuel Angell, of North Providence, stand Rhode Island greening apple trees 137 years old, still bearing edible fruit.

In the state are found chestnut trees which measure 15 feet around the trunk. A specimen of the ash tree (*Fraxinus americanus*) is found 16 feet in girth. Some large specimens of the butternut tree (*Plantanus occidentalis*) are found near the Lonsdale station, and along the banks of the Moshassuck. Some of these trees measure around their trunk 15 feet. Fine examples of this tree and the shell-bark hickory are seen in the town of Smithfield. Trunks of the maples (*Acer rubrum and Acer sacharinum*) are found that girth 10 feet. Of the pine family *Pinus strobus* presents the largest trees in this group, measuring 9 and 10 feet in circumference. Some in the swamps at South Kingstown measure around the trunk 12 feet. A magnolia (cucumber tree) is found growing in the garden of the late Mrs. Moses B. Ives, in Providence. It was planted more than half a century ago, and said to be the finest specimen in New England; and here also grows the bladder nut tree, a solitary specimen in this climate. In the front yard of Mr. Henry G. Russell, on Brown Street, may be seen a tree of the horse chestnut, of rare beauty, its spreading branches extending nearly to the ground, whose graceful cone stands alone almost motionless. When in verdure and flower it is the perfection of a tree. In front of the residence of Mr. Frederick G. King, overhanging the sidewalk on Waterman Street, is a Chinese tree whose fruit is now hanging on its naked branches. How it came to live these fifty years no one can tell, and its blossoms in purple clusters late in the spring are a rare curiosity. J. H. B.

Providence Journal, April 17, 1884.

The following, written by Mayor Prince, of Boston, when a Harvard student, and addressed "To Pupils in Elocution," has had considerable circulation, but is well worth repeating:

"The human lungs reverberate sometimes with great velocity
When windy individuals indulge in much verbosity,
They have to twirl the glottis sixty thousand times a minute,
And push and punch the diaphragm as though the deuce were in it.
***Chorus.*—The pharynx now goes up;**
The larynx, with a slam,
Ejects a note
From out the throat,
Pushed by the diaphragm."

Sciurus Carolinensis—Gray Squirrel.

This species is very common throughout the state. We have chestnuts, hickory nuts, and sweet acorns in plenty, and conditions in general are favorable to its existence. The gray squirrels produce on the average four young to the litter, born about the last of April or first of May, and they would multiply profusely were it not for the persistent war waged upon them by gunners, old and young.

The nest is frequently placed in some tall tree at the junction of a limb, bulky and looking like a crow's nest, except that few or no sticks are visible, the mass is roofed over and composed of leaves and moss. We have also seen them at the top of slender birch trees, a sort of round bunch, usually of birch leaves, from which, in the autumn, a smart shake will dislodge the occupants. Within ten miles of Providence, much of the old timber grown in very ledgy localities has been cut off, the squirrels remain, and very probably find homes and protection among the rocks. In April, 1877, Mr. G. M. Gray climbed to the nest of a Red-shouldered Hawk, in the woods near Bristol. The nest was old and large, and might have been used for several years. On his approach, away went the hawk, and out from the mass below ran a gray squirrel. There were no young in the squirrel's nest, but three eggs in that of the hawk. The squirrel was started from the same place several times afterward, while the hawk built again about an eighth of a mile distant.

The young are born blind and without hair, and are frequently taken and reared in captivity. When allowed their freedom they are prone to try their sharp teeth upon furniture and household goods in general. And my experience is, that they are also liable to bite persons, with whom they are not well acquainted, making an unpleasant wound. However, their sleek coat, beautiful tail, large eyes, and agile ways make them general favorites.

In the woods they move rapidly by a series of jumps, and frequently make tremendous leaps from tree to tree, or branch to branch, when chasing each other in play or escaping from impending danger.

Any one who has observed them knows of their habit of lying close to the bark of a tree trunk, always keeping upon the side opposite to the anxious gunner. Patient waiting in such a case will after a time reveal the tip of a nose, or the wind will play *treacherously* with the bushy *appendage*. During the summer they are found in all sorts of situations, and having never examined the stomachs, I cannot say what they may eat, but as the nuts begin to ripen they commence to congregate, and to gnaw off the green chestnut burrs, which they do not open at the time, but probably wait for time and perhaps the frosts to assist. They do not lay up a winter store, but bury nuts here and there in the ground and are to be found about all winter, frequently tunneling under the snow.

No specimens of the black variety have ever been reported for Rhode Island, but for several years past pure white ones have been taken, all, so far as can be determined, in the woods of old Warwick.

Squirrel Incidents.

While passing through a field covered with stumps, my attention was attracted to a very large gray squirrel, sitting on a stump about ten feet high. It was evidently very much excited about something, so I paused to investigate. A very large mink soon ran up the stump, with the intention of seizing the squirrel, but was met by the teeth of the latter, and forced to drop back. The squirrel had the advantage, for the mink was a poor climber, and was repelled time after time before he was able to gain a footing on the top of the stump. So interested were they in the deadly combat that I walked to within twenty feet and shot the mink with a squib of small shot. When I picked it up the squirrel did not move, but seemed dazed at the turn matters had taken. A. W. Anthony.

While seated beneath a hickory, I noticed a red squirrel busily engaged inspecting a large leaf-nest, at first cautiously smelling the trunk and limbs about it, but gradually getting bolder, it began a lively chattering and barking, and at times jumping like a cat on to the nest, first on the top, and then on the sides or bottom. This had been going on for perhaps ten minutes, when it was joined by two others of its kind. The three now seemed bent on destroying the large leaf-nest, and attacked it on all sides, but at first with a certain degree of caution, doing more reconnoitering than damage, and after about fifteen minutes, as if by common consent, they abandoned it. All three ran up the trunk, and out on to a limb about four feet above the nest, where they sat as if holding a council of war. There seemed to be no disagreement, for they returned to the attack; one took the top, another the bottom, and the third one side, and the leaves began to fall quite fast, when all of a sudden a large gray squirrel jumped out and away, as if for dear life, closely pursued by its determined enemies. I settled the difficulty by dropping the gray, and afterwards the three red ones. E. T. MACK.

A LARGE amount of brush was burned one night in the vicinity of Providence, which attracted birds from a swampy piece of woods near by. The birds are reported as flying into the flames in considerable numbers. Some were also attracted by the lights in the houses close by, and flew at the windows, and some being open, a few birds entered and were caught. Five were brought to us the next day, four of which were alive, viz.: one scarlet tanager and three Connecticut warblers, one of the latter having the adult plumage. The dead bird was a Maryland yellow-throat.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER II.

CLASS — REPTILIA.

I. ORDER — TESTUDINATA. The members of this order are recognized by the following characters. Body protected above and below by a bony armor, leaving the head, neck, tail, and limbs free. Jaws are unprovided with teeth, and resemble those of birds. Limbs always four.

1. *Sphargis coriacea Linn.* (*Dermatochelys coriacea* (VANDELLI) STRAUCH YARROW'S CHECK-LIST.)

The Leather-back, or Trunk Turtle, is both the largest and the most strange in form of the Rhode Island Testudinata. A specimen in the Brown University Museum, captured at Wood's Holl, measures six feet in length, and weighed, when alive, over one thousand pounds. It is at once distinguished by the seven longitudinal ridges along the back, and by the absence of scales; the body as well as the limbs lacking this protection. The toes are further unprovided with claws. Though there is, to my knowledge, no Rhode Island example of this comparatively rare species on exhibition, yet, from the fact that it has been taken in neighboring waters, and is occasionally seen by fishermen in our own, it is only proper that it be included in the Rhode Island fauna. The same is the case with the two following forms:

2. *Thalassochelys caretta* (LINN.) TRUE. (*T. caouana* LINN.) The Loggerhead Turtle, though a southern form, has been captured at Wood's Holl, and, it is hoped, will soon be found in Rhode Island waters.

3. *Chelonia mydas* (LINN.) SCHWEIGGER. The Green Turtle is occasionally captured while asleep, its head resting on a lobster-buoy, by the fishermen along the southern shores of our state. This is the turtle which is most used for food, and commands a high price at the markets. A specimen, selected by Prof. J. W. P. Jenks, as the largest of a number corraled in Florida, weighed upwards of one hundred and twenty-five pounds. This species is distinguished from the Loggerhead by its green color and small head. It is especially desirable that specimens of our sea-turtles be preserved for study. I know of no permanent examples in the state; yet specimens of the three above-mentioned species must often be taken by fishermen.

4. *Chelydra serpentina* (LINN.) SCHWEIGGER. The Snapping Turtle is often captured along roadsides, while it is making its journey from pond to pond. This form grows to be the largest of our fresh-water turtles, often reaching a length of three feet. A specimen in the Brown Museum measures three feet and two inches. The Snapping differs from our other turtles not only in respect to size, but in general form and structure. Generally elongated, with small and comparatively soft shell (this is notably the case with young specimens), tail provided with a dorsal row of horny tubercles, and the plastron reduced to a mere cross, this

form well merits its specific title of *serpentina.* At the time of oviposition, which is between the 10th and 20th of June, the *serpentina* leaves the water during the early morning, and, crawling to a sand-bank, digs a small *cavity* (not with its tail, as is commonly believed, but with its hind foot), into which the spherical eggs are dropped, sometimes to the number of twenty-five, or even more. The hole is then covered over, and the sand leveled off, the turtle finally wending its way back to the water, the whole operation taking not over twenty minutes. The eggs thus deposited, will, at the end of about three months, unless found by some marauding skunk—a misfortune which comes to fully half the eggs laid — give rise to as many young. This description is more fully entered into, because of its difference from that of the oviposition of all our other turtles. While the *serpentina* is satisfied with nothing but sand, the Painted and Speckled Turtles put up with any soil in which they can scrape, not a *cavity*, but a *hollow;* the *serpentina* adopts the morning, while other turtles choose the evening. All our turtles, however, are alike in that they take equal care in covering the eggs by clawing the sand, dirt, grass, or moss, as the case may be, over them, and leveling it by repeatedly drawing the body over the place of deposition.

The Snapping Turtles are most retired and solitary in their habits. Spending most of their time at the bottom of some sluggish river or muddy pond, they live on such fish and reptiles as may come within the reach of their jaws. In confinement they are especially vicious, striking at anything held towards them, and having such a tenacious hold as to allow themselves to be lifted from the ground rather than relax their jaws. They are often used as food, and take a hook baited with fish readily, though strong tackle is necessary to successfully land them.

AMONG the more recent reports of minerals is one of a petroleum well, at Bakon, Russia, which for several days after opening threw a stream of oil about forty feet into the air, and this valuable product from the Caucasian wells is appearing in the German markets.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER X.

FAMILY 12. Cancellariidæ consists of two genera, Cancellaria and Admete; Cancellaria containing seventy species of tropical and sub-tropical shells, and Admete one species, inhabiting from Massachusetts Bay to the Arctic Ocean. This species, Admete viridula, Fabricus, has not yet been found in Rhode Island waters, but I see no reason why it should not be, as it is often taken from the stomachs of fishes caught in Massachusetts Bay, and inhabits waters from ten to forty fathoms in depth. I will not occupy space in describing any species of shells not actually found in Rhode Island, but call attention to them for future reference, and for reasons given in RANDOM NOTES, No. 10. A description of it may be found in *Gould's Invert. Mass., 391, 1870.*

FAMILY 13. Terebridæ contains but one genus, six sub-genera, and about two hundred living and twenty-five fossil species, all foreign to our fauna.

FAMILY 14. Pleurotomidæ consists of three sub-families, sixteen genera and numerous sub-genera, with over five hundred species, distributed world-wide. I am not aware that any species of this family have ever been found in Rhode Island, but several species have been found off Martha's Vineyard and vicinity in deep water, and described by Prof. A. E. Verrill, to whose works I refer the reader, simply mentioning the names, localities, etc.

Pleurotoma Dalli, Verrill and Smith. sp. nov. *Cat. Mar. Moll., 451, 1882.*

Distr., off Martha's Vineyard, 94 to 146 fathoms. Off Delaware Bay, 104 fathoms.

Bela bicarinata, Couthouy. *Bost. J. Nat. Hist., II. 104, 1839.*

Distr., Cape Cod to Greenland; Iceland, Norway, Spitzbergen. Off Martha's Vineyard, 28 fathoms.

Bela decussata, Couth. *Bost. J. Nat. Hist., II. 183, 1839.*

Distr., New England to Labrador; Greenland, Nova Zembla. Off Martha's Vineyard, 34 fathoms.

Bela cancellata, Mighels *Proc. Bost. Soc. Nat. Hist., I. 50, 1841.*

Distr., Martha's Vineyard, 126 fathoms, to Greenland, etc.

Bela harpularia, Couth. *Bost. Journ. Nat. Hist., II. 106, 1839.*

Distr., Long Island Sound to Nova Scotia. Off Block Island, 20 to 28 fathoms.

Bela concinnula, Verrill. sp. nov. *Cat. Mar. Moll., 468, 1882.*

Distr., off Newport and Martha's Vineyard, 252 to 487 fathoms, to Nova Scotia.

Bela hebes, Verrill. *Proc. U. S. Mus. Nat., III. 367, 1880.*

Distr., five specimens off Newport, 282 to 500 fathoms.

Bela pygmæa, Verrill. sp. nov. *Cat. Mar. Moll., 460, 1882.*

Distr., off Martha's Vineyard, 365 fathoms.

Bela incisula, Verrill. sp. nov. *Cat. Mar. Moll., 461, 1882.*

Distr., off Newport, 500 fathoms, to Nova Scotia.

Bela tenuilirata, Dall. *Am. J. Conch., VII. 98, 1871.*

Distr., one dead specimen off Martha's Vineyard.

Bela pleurotomaria, Couth. *Bost. Journ. Nat. Hist., II. 107, 1839.*

Distr., off Martha's Vineyard, 255 fathoms, to Labrador.

Daphnella cerina, Kurtz and Stimpson. *Proc. Bost. Soc. Nat. Hist., IV. 115; 1851.*

Distr., Buzzard's Bay, at Quisset, 3 to 5 fathoms. Long Island Sound to Tampa Bay, Florida.

Daphnella Carpenteri, Verrill and Smith. *Am. J. Sc., XX. 391, 395, 1880.*

Daphnella comatotropis, Dall. *Bull. Mus. Comp. Zoöl., IX. 58, 1881.*

Distr., off Martha's Vineyard, 100 fathoms. One dead specimen.

Daphnella limacina, Dall. *Bull. Mus. Comp. Zoöl., IX. 55, 1851.*

Distr., four specimens, Martha's Vineyard, 368 fathoms.

Taranis Mörchii, (Malm.) Jeffreys.

Distr., off Newport, 365 fathoms, two specimens. Gulf of Mexico, 805 fathoms. (Dall.)

Taranis pulchella, Verrill. *Proc. U. S. Nat. Mus., III. 368, 1880.*

Distr., off Martha's Vineyard, 487 fathoms. One specimen.

Pleurotomella Agassizii, Verrill and Smith. *Am. J. Sc., XX. 394, 1880.*

Distr., off Newport and Martha's Vineyard, 65 to 252 fathoms. Off Delaware Bay, 435 fathoms.

Pleurotomella pandionis, Verrill. *Proc. U. S. Nat. Mus., III. 368, 1880.*

Distr., off Martha's Vineyard, 310 fathoms.

Family 15. Conidæ, with about three hundred living and nearly one hundred fossil species, all foreign to our fauna.

Family 16. Strombidæ, eighteen genera and more than one hundred species, all absent from our waters.

Family 17. Cypræidæ.

Family 18. Ovulidæ.

Family 19. Cassididæ.

Family 20. Doliidæ, all foreign to our shores, excepting one species of Dolium, dredged off Martha's Vineyard in 202 fathoms; this is the

Dolium Bairdii, Verrill and Smith. *Am. Jour. Sci., XXII. 296, 1881.*

Family 21. Naticidæ contains about three hundred or more species, a few of which inhabit our shores. The naticidæ are a family of carnivorous gasteropods, which inhabit all parts of the world, and are found on sandy shores from high-water mark to 100 fathoms. They are exceedingly voracious, feeding upon dead fish, and upon all animal substances thrown up by the tide, and are in turn devoured in large numbers by the codfish and haddock. The small round holes, seen in dead bivalves, are bored by species of this family. How they accomplish this is not certain; some authors suppose that they secrete an acid which dissolves the shell of its victim. I do not believe this theory, but can offer no satisfactory one. If any of the readers of Random Notes can explain how they do it, I would be happy to be informed. They certainly do drill these holes in the bivalve shells, and suck out the contents through the hole thus made. They have an enormous foot, capable of enveloping completely the object on which they prey; when extended on the sand it is four times the size of its shell, and can be reflected back so as to cover and hide the shell from sight; it is also doubled up in front so as to form a wedge-shaped digger, with which it plows up the wet sand in search of bivalves, as soon as the tide begins to uncover it. Its head is hidden behind the plow, and as its eyes would also be hidden and of no use to it, these animals are blind.

We have all noticed, in summer, curious, sandy, saucer-shaped objects, lying on the shore, between tides. They have been objects of much speculation, and have been considered by naturalists as zoöphites, and have been given a dozen or more erroneous names. They are now known to be the nidus or nest, which is made by the natica for the protection of its eggs. This nidus is composed of small grains of sand, glued together and filled with little cells; each cell contains an egg, having a yellow nucleus, which is the embryo shell; while wet, these cases are elastic, but when dry are very friable, and fall to pieces on touching them. The two largest species of this family inhabit the United States, one in New England and the other in Oregon. Descriptions of the species inhabiting Rhode Island will be given in the next paper.

(To be continued.)

The Fern Flora of Southern California.

[From advance sheets of *Santa Barbara As It Is*, now in process of publication by the Independent Publishing Co., Santa Barbara, Cal.]

BY LORENZO G. YATES.

FERNS.

THE remarks on the peculiarities of the climate of this county as regard the molluscan fauna, will apply also to the flora of this region so far as the Felices or Ferns are concerned. While some of our species are found in the northern part of the state, and are not found south of us, others begin here and extend south, Santa Barbara being the southern limit of species found in northern California and Oregon, and the northern boundary of others found south, into Arizona and Mexico; others again are peculiar to this and the counties immediately adjacent, and one species at least, is peculiar to Santa Barbara County on the Pacific coast, and found elsewhere only in Florida and Texas. We find the following species in this county: The Adiantums, or "Maiden-hair Ferns," are remarkably well represented, all the species known in the United States, with perhaps one exception, being found here.

Adiantum pedatum, in the northern portion of the county. A. capillus veneris, A. emarginatum, in the wooded cañons in the neighborhood of living water; hanging in immense masses from the boulders under the spray of falling water.

Aspidium patens, a remarkably fine and pretty fern; the only localities where it is found in the United States being Bartlett Cañon in this county, and in Florida and western Texas.

Aspidium rigidum, variety argutum, found throughout the country in abundance.

Cheilanthes Californica, commonly called lace fern, a very delicate and pretty species, found only in the Coast Range of California, and much sought after by collectors.

Cheilanthes Cooperæ, first discovered in Santa Barbara County and named for Mrs. Ellwood Cooper, a lady who takes great interest in the collection of ferns.

Gymnogramme triangularis, the golden back or gold fern, and under certain conditions of growth taking the form of the so-called silver fern, common everywhere.

Pellæa andromedæfolia, P. ornithopus and brachyptera; all the pellæas improve under cultivation.

Peteris aquilina, var. lanuginosus, brake fern, common.

Woodwardia radicans, variety Americana, is found growing in and near mountain streams. Magnificent specimens of this fern are used for decoration.

A DARING RED-SHOULDERED HAWK.—A well-known taxidermist sends us the following, which was related to him by the hero of the adventure: Having been out to his pasture to salt his cattle, he was returning when he ran across a Partridge which he killed with a stone. Securing his game he continued his homeward walk, and while passing through a small piece of pine woods a Hawk swooped down and attempted to take the dead bird from him. In his disengaged hand he carried a bull-ring, and, recovering from his surprise, brought it to bear upon the Hawk's head, striking a blow which killed it at once.

This seems rather a strange story, but the taxidermist affirms that the man appeared at his store with the Partridge, bull-ring, and Hawk in his hands, the latter looking as though killed with such an instrument.

CONCHOLOGICAL CHECK-LIST. XI.

J. RITCHIE, JR.

Family. Cyclostomacea Pfr.
Sub-family. Cyclostomea Pfr.
Tudora abtiana Pfr.
adamsi Pfr.
armata C. B. Adams.
augustæ C. B. Adams.
avena C. B. Adams.
chemnitzii Wood.
columna Wood.
costata Menke.
dislocata Baird.
dulieri Pfr.
excurrens Gundlach.
fascia Wood.
fecunda C. B. Adams.
ferruginea Lam.
griffithiana C. B. Adams.
lurida Gundlach.
maritima C. B. Adams.
megacheila Pot. et Mich.
moreletiana Petit.
mutica C. B. Adams.
nobilis Pfr.
ovata Pfr.
papyracea C. B. Adams.
pupiformis Sow.
pupoides Morel.
quaterna Lam.
shepardiana C. B. Adams.
simulans C. B. Adams.
tappaniana C. B. Adams.
umbricola Weinl.
versicolor Pfr.
wrighti Pfr.
Leonia mamillaris Lam.
scrobiculata Mouss.

Sub-family Cistulea Pfr.
Cistula agassizi Charp.
agrestis Gundlach.
aguadillensis Pfr.
antiguensis Pfr.
arctistria Pfr.
aripentis Gupp.
bilabris Menke.
catenata Gould.
cinclidodes Pfr.
confusa Pfr.
cumulata Pfr.
fallax Pfr.
grateloupi Pfr.
gruneri Pfr.
inculta Poey.
Cistula illustris Poey.
interstitialis Gundlach.
jimenoi Arango.
küsteri Pfr.
l'argillierti Pfr.
limbifera Menke.
lineolata Lam.
livida Reeve.
lugubris Pfr.
mackinlayi Gundlach.
mordax C. B. Adams.
orbignyana Petit.
pallida Pfr.
pauperata C. B. Adams.
platychila Pfr.
pleurophora Pfr.
radiosa Morel.
radula Pfr.
rigidula Morel.
riisei Pfr.
rostrata Pfr.
rufilabris Beck.
saulisæ Sow.
scabrosa Humphrey.
tamsiana Pfr.
thoreyana Phil.
trochlearis Pfr.
Chondropoma abnatum Gundlach.
angustatum Pfr.
assimile Gundlach.
basicarinatum Reeve.
biforme Pfr.
blandum Pfr.
blauneri Shutt.
caniculatum Gundlach.
candeanum Orb.
canescens Pfr.
caricæ Pfr.
chordiferum Pfr.
cirratum Wright.
claudicans Poey.
cordovanum Pfr.
crenulatum Fer.
cumanense Pfr.
delatreanum Orb.
dentatum Say.
dilatatum Gundlach.
discolorans Wright.
dissolutum Poey.
echinulatum Wright.
egregrium Gundlach.
emilianum Weinl.
erectum Gundlach.

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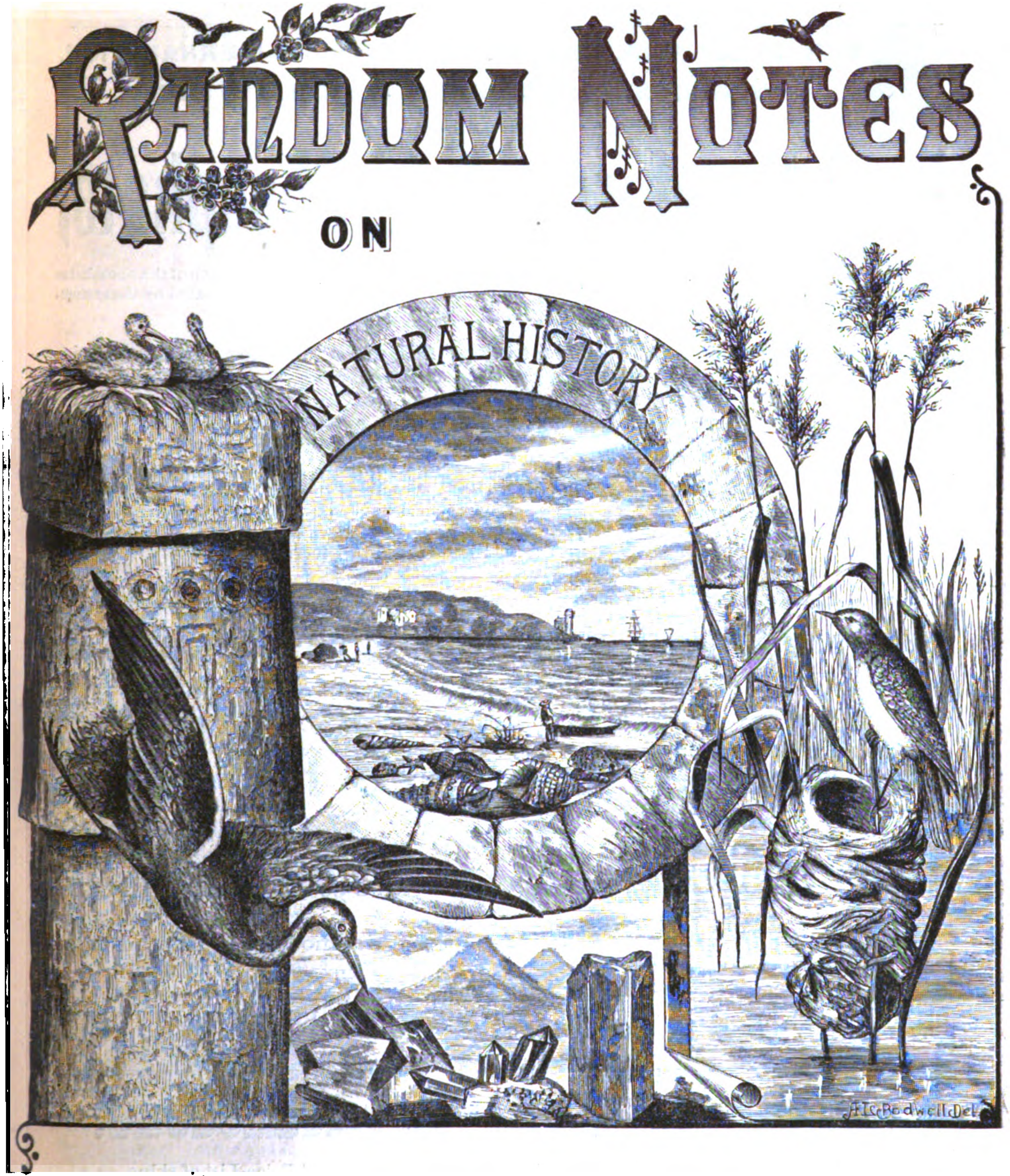
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SPECIAL NOTICE.

WE have secured several copies each of Nos. 1 and 2, Vol. 1, which those who desire them may have for 10 cents each.

Remarks on the Migration of Birds in North America.*

BY C. HART MERRIAM, M. D.

THE subject of the migration of birds is one of such magnitude and importance, that the American Ornithologists' Union at its first congress (held in September, 1883), appointed a special committee for its investigation. This committee prepared a circular, setting forth the objects in view and the methods by which they were to be attained, specifying the division of the territory of the United States and British North America into thirteen districts, and supplying instructions to observers, concerning the character and extent of the data desired, which were classed under the heads of Ornithological, Meteorological, and Contemporary and Correlative phenomena. Six thousand of these circulars were distributed.

Through the co-operation of the Department of Marine, of Canada, and of the Light-house Boards of the United States and Newfoundland, blank schedules were also supplied to the keepers of light-houses, light-ships, and beacons, throughout the whole of North America.

It is gratifying to know that, as a result of the enormous amount of labor attending the distribution of these circulars and schedules, the committee has already received returns from nearly one thousand observers, which may be considered an excellent showing for the first season's work. The stations from which returns have come are scattered over the whole country, extending in the East from Sombrero Key, Florida, to Newfoundland; and in the West from Arizona and Southern California to British Columbia. They are most numerous in New England, the Atlantic district, and the Mississippi Valley.

Comparatively few of the observers are ornithologists, or even bird-collectors, the great bulk being intelligent farmers and tradesmen. Those who know only the commonest birds, such as the robin, bluebird, bobolink, martin, and chimney swift, can furnish important data to the committee, and their services are eagerly sought.

The material now in hand is of great value, and is so voluminous that the committee cannot properly arrange, systematize, and publish it, without government aid. Its value does not consist wholly in its scientific interest, for it has direct bearings upon many of the problems with which the agriculturist is directly concerned.

The committee has undertaken to ascertain the whereabouts of all our birds during the winter season, and the times of leaving their winter-homes; to determine, if possible, the number and extent of the chief avenues of migration in North America, and the average rate of speed at which the different species travel; to find out the dates of their appearance at and disappearance from at least a thousand localities, both in spring and fall, for a period of years; and to map out the *breeding areas* of every species which rears its young in North America, north of Mexico.

Birds are known to migrate with great regularity. Still, the exact date of the arrival of a given species at a given locality varies somewhat from year to year, according to the advancement of the season, and the state of the weather. For example, severe storms, gales of wind, and protracted periods of unusually high or low temperature (for the locality and time of year) are among the atmospheric conditions that are known to exert marked effects upon their movements, The opening of the leaves and the flowering of certain plants, with the correlative appearance of a multitude of insects, are also among the factors that have to do with the abundance of many species.

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The time of a bird's appearance at a certain place does not depend so much upon the weather *at that place*, as upon the weather *at some distant point* (perhaps several hundred miles away) in the direction *from* which it comes. It is probable that all North American birds, excepting a few of the grouse family, are migrants to a greater or less degree. Many resident species are migrants as individuals. their summer and winter ranges overlapping. Most birds migrate chiefly by night. In clear weather they fly high, often from one to two miles above the country over which they are passing, thus obtaining an unobstructed view of a large extent of territory, which enables them to lay out their course by definite landmarks. During dark nights, particularly in foggy weather, they often lose their way, become confused, and fly directly toward any light that may chance to lie within the field of vision. Thus, every year, many thousands dash themselves to death against light-houses and light-ships.

The great majority of birds migrate by definite routes, following the same course year after year. These " avenues of migration " are most strongly marked in aquatic, marsh, and river-dwelling species. It is also well known that, in nearly all birds, the same individuals return to the same identical locality, year after year.

In the short space allotted to this article it is impossible to give credit to the multitude of individuals who have contributed the material on which it is based. Suffice it, then, to return thanks collectively to the thirteen superintendents who have spared neither pains nor expense to make their reports as full and valuable as possible ; and to the observers, nearly one thousand in number, without whose industry and zeal the committee would have nothing to report.

The southernmost station from which the committee has received returns is the lighthouse at Sombrero Key (near Key West), off southern Florida. It is, from its geographical position, a very important station, and, fortunately, is in charge of a most excellent keeper, Mr. M. E. Spencer, who has already sent the chairman several packages of birds for identification — among them one of the rarest of all North American species. From this point northward to Cape Breton, Prince Edward Island, the Magdalens, Newfoundland, Belle Isle, and Greenly Island, off Labrador, numerous and valuable returns have been sent in by intelligent light-keepers, and are now in the hands of the committee.

Following are the dates at which a few common and well-known birds were recorded from various localities in North America, during the spring of 1884.*

CATBIRD (*Mimus carolinensis*).

Statesville, N. C	April	16
Tree Hill. Tenn	"	15
Buffalo, W. Va	"	27
Camden, Ind	"	27
Columbus, O.	"	26
Petersburg, Mich	"	29
Cleveland, O.	May	1
Battle Creek, Mich	"	1
New Lexington, Penn	April	29
Philadelphia, Penn	May	1
Atglen, Penn	"	4
Brooklyn, Penn	"	8
Sing Sing, N. Y	"	2
Albany, N. Y	"	3
Tully, N. Y	"	5
Lockport, N. Y	"	6
Painted Post, N. Y	"	5
Locust Grove, N. Y	"	12
Lowville, N. Y	"	13
Watertown, N. Y	"	23
Lake George, N. Y.	"	12
Hammondville, N. Y	"	18
Montreal, Canada	"	20
Quebec, Canada	June	1
Saybrook, Conn	May	3
East Hartford, Conn	"	5
Holyoke, Mass	"	11
Greenfield, Mass	"	12
Wing's Neck, Mass	"	17
Thetford, Vt	"	19
Burlington, Iowa	April	20
Pierce City, Mo	"	26
Manhattan, Kansas	"	28
Des Moines, Iowa	"	30
Ames, Iowa	May	8
Vermillion, Dakota	"	8
Minneapolis, Minn	"	9
Frazee City, Minn	"	17
Alda, Neb	"	14
London, Ont	"	1
Hamilton, Ont	"	3
Port Colborne, Ont	"	1
Listowel, Ont	"	8
Leamington, Ont	"	15
Presque Island, Ont	"	15
Wolf Island, Ont	June	1
Ilse á la Pierre	May	15
Farther Point, P. Que., Canada	"	12

The Baltimore Oriole (*Icterus galbula*) is rather a late comer, usually waiting for settled weather before venturing northward. Hence its progress, being subject to comparatively few interruptions, is much more regular than in those species which migrate earlier. In the spring of 1884, orioles were reported from Jessamine Co., Ky., April 18; Camden, Ind., April 24; College Hill, O., April 27; Columbus, O., April 28; Petersburg, Mich., April 30; Cleveland, O., and Battle Creek, Mich., May 1; New Lexington, Penn., April 28; Brooklyn, Penn., May 6; Long Island City, and Sing Sing, N. Y., May 2; Lockport, N. Y., May 4; Painted Post, N. Y., May 5; Locust Grove. N. Y., May 6; Auburn, N. Y., May 6; Watertown, N. Y., May 11; Lake George, and Hammondville, N. Y., May 13; London, Ont., May 8; Hamilton, Ont., May 9; Ottawa, and Listowel, Ont., May 13; Portland, Conn., May 2; East Hartford, Conn., May 4; Holyoke, Mass., May 6; Greenfield, Mass., and Hanover, N. H., May 15; Thetford, Vt., May 10; Weterboro, Fryeburg, and Brewer, Me., May 16; Moosehead Lake, Me., and Montreal, Canada, May 24.

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* The data here given constitute but a small portion of the material in hand concerning the species mentioned, and have been selected merely to show in a general way the movement of the van during the past season.

The Bobolink (*Dolichonyx oryzivorus*) was reported, by the keepers of light-stations, from North East Harbor, Me., May 1; Windmill Point (near Prescott), Ont., May 8; Cherry Island, Ont., May 30; Leamington, Lake Erie, May 20; Long Point, Lake Erie, May 22; Robertson's and McMann's Points, N. B., June 1; Presque Isle, Lake Ontario, June 15.

The Chimney Swift (*Chætura pelasgica*), according to the same observers (light-keepers), was seen at Egg Island, N. J., April 30; Wing's Neck, Mass., May 3; North East Harbor, Me., June 2; Drew's Head, N. B., May 20; Cape Spencer. N. B., May 28; McMann's Point, N. B., June 1; Prince Edward Island, May 15; Sand Point (Canso), N. S., May 24; Plateau Rock (Gaspé Co.), June 1; Cherry Island, Ont., May 1; Prescott, Ont., May 5; Wolf Island (where the St. Lawrence leaves Lake Ontario), May 20; Port Maitland, Lake Erie, May 4; Leamington, Lake Erie, May 25; McGulpin's Point, Mich., May 24.

NIGHTHAWK (*Chordeiles popetue*).

Augusta, Ga.	April	25
Jessamine Co., Ky.	"	30
Camden, Ind	May	4
Cleveland, O.	"	10
Battle Creek, Mich	May	11
McGulpin's Point, Mich	"	25
Frogmore, S. C	April	13
Statesville N. C	"	25
New Market, Va.	May	1
Philadelphia, Penn.	"	1
Lancaster, Penn	"	1
Brooklyn, Penn	"	3
New Lexington, Penn	"	15
Atglen, Penn	"	15
Cape May City, N. J.	"	18
Sing Sing, N. Y.	"	20
Locust Grove, N. Y	"	24
Hammondville, N. Y.	"	22
Tully, N. Y.	"	17
Lockport, N. Y.	"	17
Watertown, N. Y	"	23
Saybrook, Conn	"	10
Greenfield, Mass	"	16
Wing's Neck, Mass.	"	17
Thetford, Vt.	"	20
Negro Island, Me.	"	20
Owl's Head, Me.	"	21
Blue Hill Bay, Me.	"	22
Calais, Me.	"	23
North East Harbor, Me	"	24
St. John, N. B	"	14
Yarmouth, N. S	"	18
Cape Spencer, N. S.	"	21
Quaco, N. S.	"	26
Baccaro, N. S	"	30
Prince Edward Island.	June	1
Batchewana Bay, Lake Superior	May	10
Killarney, Lake Huron	"	15
Windmill Point (Prescott), Ont	"	20
Cherry Island (L. St. Francis)	"	25
Montreal, Canada	"	21
Quebec, Canada	"	25

Feldspars.

THE different minerals belonging to the feldspar group are composed of silica, alumina, and soda, lime, or potash. They are distinguished from other minerals by their perfect cleavage in two directions, leaving faces that are smooth and reflect the light with a peculiar flash. They are harder than limestone and softer than quartz, which two they most resemble, and are not decomposed rapidly by hydrochloric acid, and with effervescence like limestone.

The more common white varieties are mined and used extensively in the arts, and the decomposition of feldspathic rocks results in clay used from time immemorial in the manufacture of pottery.

The Boston *Journal of Commerce*, mentioning some of the more precious kinds, says:

" Amazon stone is a bluish green variety of the common kind of feldspar called orthoclase. In composition it is a silicate of alumina and potash. It is an opaque stone with a somewhat pearly lustre and a hardness of 6, or 6.5, just below quartz. It is quite brittle, but takes a good polish. It was first discovered on the banks of the Amazon, from which circumstance it takes its name. It is found at Lake Baikal, in Siberia, and Pike's Peak, Colorado; also in North Carolina, Pennsylvania, and Mt. Desert, Me.

"Moonstone, or adularia, agrees in composition and hardness with Amazon stone. It has a pearly or silvery reflection not unlike that of the moon, from which it takes its name. It belongs to the cheaper grade of gems, though in some parts of Europe it has at times been much esteemed. The finest specimens come from Ceylon. It is found in this country at Media, Penn., and in Virginia.

"Sunstone is like moonstone in composition and hardness. It is of a yellowish color, reflecting sparkles of light in various directions, owing to minute particles of iron oxide which are disseminated through it. It is found in Siberia, Norway, and Ceylon, and in the United States in the same localities as moonstone. It is also called aventurine feldspar.

"Labradorite, or Labrador spar, is a variety of feldspar of various shades, the kind used in jewelry having a rich blue color. In composition it is a silicate of alumina, lime, and soda, with a hardness of 6. It is remarkable for its beautiful play of colors, and its sparkling reflections, like aventurine feldspar. Though generally blue, green, yellow and red kinds are not uncommon, sometimes pearly gray. Labradorite was first found on the coast of Labrador toward the latter part of the last century, but has since been discovered in Norway, Sweden, Russia, Canada, and in this country in New York, Pennsylvania, and various other places."

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER III.

5. *Aromochelys odorata* (LATR.) GRAY. (*Ozotheca odorata* AGASSIZ, *Sternothœrus odoratus* STORER'S REPORT.) The Musk or Mud Turtle is uncommonly but not rarely found. Its small size, the total length being less than six inches, the shell about four; convex carapace, with the dorsal row of plates generally slightly keeled; small plastron, resembling that of *serpentina* as much as that of either the Painted or Speckled Tortoises; and the pointed head, together with the strong odor, render it almost impossible to confound this form with any other.

6. *Malacoclemmys palustris*, (GMEL.) AGASSIZ. The Marsh or Salt-water Terrapin is the only representative of our smaller TESTUDINATA which is found away from fresh water. Its long and well developed limbs, which enable it to progress with remarkable speed, both through the water and on land; its large solid shell, the scales of which are beautifully marked with concentric striæ, the dorsal row being keeled; and the ivory-like jaws serve to distinguish this form at a glance from all other turtles. The dimensions are as follows: Length of shell 8 inches, length of sternum 7 inches, tail 1¾ inches. The Marsh Terrapin was first brought to the notice of naturalists by a German army surgeon during the Revolutionary War, being by him called the *Testudo terrapin*. A widely extended animal, being found from Massachusetts to Mexico, it is, along the shores of the Southern States, collected in large numbers during the breeding season for food. From its exceedingly cautious and timid nature, as well as from its swimming powers, it is not as often captured as turtles equally abundant but of less active habits.

7. *Chrysemys picta* (HERM.) GRAY. The Painted Tortoise is one of our most beautiful reptiles, its bright colors distinguishing it from the other members of its order. General color above, dark brown, a longitudinal yellow line dividing the vertebral plates which are further bordered by similar, though broader, bands. The lateral plates are also similarly marked along their anterior edge, while the marginal plates are concentrically painted with yellow and red. Below, the sternum usually presents an unspotted uniform bright yellow color, though a specimen captured in Cranston, by the writer, was of a beautiful purple. This is one of our most common turtles, hundreds, sunning themselves, being seen during a short ride on the cars through the more swampy portions of the state. J. A. Allen, in his "Catalogue of the Reptiles and Batrachians of Massachusetts," speaks of this species as the one whose shrill, piping note is heard, especially on rainy days, during May and June. It is quite pos-

sible that the so-called Western Painted Tortoise, the *Chrysemys marginata* Agassiz, is found in Rhode Island waters. The difference between the two is very slight. While *C. picta* has the anterior yellow bands of the second lateral plates continuous with the band of the second vertebral plate, *C. marginata* has the bands considerably separated. Specimens of both varieties have been taken in Middleboro', Mass., though in the few Rhode Island specimens I have examined, no marked variation could be found.

8. *Chelopus guttatus* (Schweigger) Cope. (*Nanemys guttata* Ag., *Emys guttata* Schneider.) The Spotted or Speckled Turtle is found as abundantly as the Painted, and inhabits similar localities. Its distinguishing features are its black, yellow spotted back, and yellow, striated, and black blotched sternum. In size it is considerably less than *picta*.

These turtles are especially fond of warm mud-ponds, from which they crawl during the day and crowd together on such floating logs and partially protruding roots as are always found in such situations; the slightest alarm, however, is sufficient to set the colony in confusion, and, in a moment, all have, with a splash, disappeared.

As a result of several dissections, I wish to correct a statement made in the first number of this series. The concavity or convexity of the plastron is no indication of the sex.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

Chapter XI.

Genus Natica, (Adamson, 1757.) Lam.

Shell sub-globose or oval, spire slightly elevated, aperture semi-lunar, a spiral columella callus entering the umbilicus. Operculum horny, with a calcareous outer layer.

19. Natica pusilla, Say.

Shell thin, sub-oval, cinerous or rufous, sometimes with one or two obsolete, dilated, revolving bands; columella with a white callus pressed into the umbilicus, almost filling it, leaving only an arcuated, linear, vertical aperture. Length, ¼ inch.

Described by Say, *Jour. Ac. Nat. Sc., II. 257, 1822.*

Distr., Vineyard Sound to Northern Florida. Georgia (Couper). Fort Macon, N. C. (Coues). Gardiner's Bay, L. I. (S. Smith). Vineyard Sound and Buzzard's Bay, 2 to 10 fathoms (Verrill).

Genus Lunatia, Gray, 1847 (Globularia, Sw.).

Shell sombre-colored, covered with a thin, dark epidermis; sub-globose; spire elevated; aperture semi-lunar; umbilicus wide; operculum corneous. Inhabits the cold and temperate zone.

20. Lunatia heros, Say.

Syns.:

Natica heros, Say, Gould, DeKay, etc.

Ampullaria borealis, Valenc.

Lunatia heros, Stimp., Dall., Tryon, Perkins, etc.

Shell sub-globose; ash-colored or brownish, shining when divested of its thin, yellowish epidermis; whorls five, very convex, slightly flattened near the suture; lip sharp above, becoming rounded and thicker as it descends, and at the umbilicus slightly expanded; a thin layer of enamel completes the rim of the aperture; the interior of the mouth of the shell is of a delicate, sometimes iridescent chestnut color, with a yellow margin; umbilicus large, round; operculum corneous. Length 3 to 5 inches, breadth about 3½ inches. It is the largest species known, and inhabits from New England to Nova Scotia. It is very abundant and of large size on the coast of Maine, and is collected and sold for food in the markets in Portland. It is not common south of Cape Cod, and when found is smaller than those found north of it. Its northern limit in Rhode Island is the sandy shore between Warren and Nayatt Lighthouse. Described by Say, *Journ. Ac. Nat. Sc. Phila., II. 228, 1822.*

21. Lunatia triseriata, Say.

Syns.:

Natica triseriata, Say, Gould, DeKay, Philippi.

Lunatia heros, var. Verrill.

Shell ovate-globose, of a yellowish-white or ashy color; whorls five, convex, covered with lines of growth; spire elevated; aperture ovate; lip sharp and white within;

inner lip with a thick white callus slightly modifying the umbilicus, which is nearly free; aperture dark chestnut, showing the exterior markings, of which there are *three* revolving series of twelve or fifteen dark chestnut or red, oblong or square, oblique spots on the body-whorl, and *one* on the upper whorls. "Found on the New England coast north of Cape Cod, on flats left bare by the tide, but it is as yet doubtful whether it passes to the south of this limit" (Gould). We find it in Rhode Island more abundantly than the preceding species, but its limit in our bay is below Bristol. It is found living on the shore of the Island of Rhode Island, and dead shells on the opposite shore at Bristol Neck. It is quoted from Fire Island, L. I. (S. S. Smith), coast of New Jersey (A. E. Verrill).

Professor Verrill, in the April number of *Silliman's Journal* for 1872, p. 282, argues that triseriata and heros are only varieties of the same species. He gives an instance of a large and characteristic specimen of L. heros, from Eastport, Me., which was broken up, and the inner whorls showed the colored spots of triseriata. He says, "This specimen was a well-marked triseriata until half grown, when it changed into a heros." I have found, in our bay, young specimens of heros of the same size as those supposed to be adult triseriata, without the markings or any apparent similarity. Will some person posted in this matter decide the question? Two other species of Lunatia are given in Verrill's *Cat. Mar. Moll., 516, 1882*, as occurring near Rhode Island, which I have never seen.

Lunatia nana, (Möller) Sars. Off Martha's Vineyard and Block Island, 22 to 29 fathoms.

Lunatia levicula, Verrill. Same localities.

GENUS NEVERITA, RISSO, 1826. (NATICARIA, H. & A. ADAMS)

Shell orbicular, depressed; spire flattened; aperture wide, semi-lunar; umbilicus nearly filled by a lump of callus. Operculum horny. Animal capable of retraction within the shell.

22. NEVERITA DUPLICATA, SAY.

Syns.:

Natica duplicata, Say, Gould, DeKay, Philippi, von Reeve.

Natica recluziana, Desh., Reeve.

Neverita duplicata, Stimp., Dall., Tryon, Perkins, etc.

Shell conical-ovate, solid; surface marked with revolving lines and more conspicuous lines of growth; color light chestnut-brown on the upper half of the shell, and ashy below; whorls five, with a dark band revolving on the spire, just above the suture; spire depressed; aperture ovate-oblique; outer lip sharp and thin; inner lip covered with callus which almost fills up the umbilicus; operculum horny, thin, semi-transparent. Length 2 inches, breadth $2\frac{1}{4}$. Very abundant in Rhode Island, on sandy beaches between tides. Inhabits from Massachusetts to Florida. Rare north of Cape Cod. Abundant at Nantucket. Long Island, New Jersey, and southward. The animal is large, of a dirty white color, with a foot capable of enveloping the whole shell, perforate with minute openings, from which, when disturbed, the animal squirts water. The large ribbon-shaped egg-masses, resembling a saucer with the bottom knocked out, composed of ova and agglutinated sand, are found in April and May, in great numbers, on all our sandy shores, especially near Nayatt.

GENUS MAMMA, KLEIN, 1753. (POLINICES, MONTF., NATICELLA, GUILD.)

Shell ovate, solid, smooth; spire short, acute; aperture semicircular; inner lip thickened; umbilicus funiculate; operculum simple, horny; animal retractile.

23. MAMMA IMMACULATA, TOTTEN.

Shell sub-ovate, solid, milk-white, glossy; whorls five, spire short and pointed; outer lip oval, curved at the base; inner lip covered with ivory-white callus; umbilicus free, open and round; operculum corneous. Length $\frac{13}{40}$ inch, breadth $\frac{9}{40}$.

This species was first discovered by Colonel Totten, of the U. S. Navy, in Newport harbor, and described by him in *Silliman's Journal, XXVIII. 351.* It is often taken from the stomachs of fish caught in Massachusetts Bay. It is probably not found in our bay this side of Newport. Stimpson says it is found on the whole coast of New England.

The only remaining species of the Naticidæ inhabiting near Rhode Island are:

Lamellaria pellucida, Verrill. *Am. J. Sc., XX. 391. 395, 1880. Proc. U. S. Nat. Mus., III. 372. 1880.*

Distr., off Martha's Vineyard. 86 to 155 fathoms. Off Delaware Bay, 130 to 155 fathoms.

Lamellaria pellucida, var. Gouldii, Verrill. *Cat. Mar. Moll., 518, 1882.*

Distr., off Martha's Vineyard, 224 to 458 fathoms. Off Chesapeake Bay.

(To be continued.)

On the Admission of Certain New Species of Mollusks into the Fauna of Rhode Island.

THE answer given to Professor Verrill in the October number of RANDOM NOTES, regarding the omission of certain new species of Mollusks, said to belong to Rhode Island, most assuredly proves the correctness of Mr. Carpenter's judgment.

By Professor Verrill's own showing, the habitat of several of the species referred to appears to have been almost exclusively arctic in character, while the remainder, with one or two exceptions, found their most congenial conditions in the profound depths of the gulf stream, or at an equally low horizon near its borders.

It is undoubtedly true that certain well-known causes have changed the natural abodes of very many littoral species, but there is probably no evidence whatever to show that species accustomed to the semi-tropical conditions of the gulf stream ever venture into the shallow and colder waters of the coast; and it does not appear that either of those in question were found at a less depth than sixty fathoms, nor, perchance, within fifty miles of the Rhode Island shore.

Could a stronger reason than this be offered for excluding them from "Papers on the Shell-bearing Mollusca of that little state?" Perhaps not. It is impossible, therefore, to understand why Professor Verrill should insist upon numbering them with the fauna of its coast, where, so far as is known, they have never been seen alive.

Indeed, without the dredge, and the skill to control it in depths hitherto deemed unattainable, it is safe to assume that the Professor's new species would have forever remained absolutely unknown; a probability that cannot be truthfully applied to *any* littoral species.

Other reasons might be adduced in support of Mr. Carpenter's decision, but I will only add that the view given of the subject has been indorsed by the several conchologists with whom I have conferred, and by one of the ablest biologists of the U. S. Fish Commission as well.

Very truly,
JOHN FORD.

PHILADELPHIA, PENN., Oct. 16, 1884.

Mistletoe.

THE curious plant called mistletoe is peculiarly associated with Christmas. It is the *viscum allum* of science, and is remarkable in many ways. Contrary to the general tradition, it is found most commonly on the apple-tree, not on the oak; but it may occur on that tree as well as a number of others. It has a very wide range in Europe, being found in Norway on the one hand and Sicily on the other. It is well known in England, says Schouw, in his *Earth, Plants, and Man:*

"Let us imagine that on a winter's day we see upon the branches of an apple-tree a bunch of intercrossing, yellowish-green twigs, bearing leaves of the same color. The unusual character of this sight arrests our attention. Perhaps we at first suppose it to be a climber like the ivy, which, although fixed in the ground by its root, has wound itself up the trunk and become attached to this and the branches by means of its sucker roots; but this idea must be abandoned, for we see nothing of it on the lower part of the trunk, only at the top. We then cut off the apple branch to examine the yellowish-green plant more closely. We see that it is wood, just as the apple-tree is; that annual rings occur in its wood, as in other trees; and when we trace its numerous crossing shoots to their origin, we find that the main stem springs from the branch of the apple-tree; we discover, moreover, that the union is not confined to the barks, but that the wood of this plant is connected with that of the apple, somewhat as a graft is connected with the wild stock upon which it has been grafted. But the matter only becomes more strange from this, for it is very readily perceived that the apple-tree cannot have become so changed as to be able to send out yellowish-green forked shoots, and to bear leaves, thick, feathery leaves, too, in winter. As little can the apple-tree bear little leathery flowers with a four-parted envelope, or a berry filled with tenacious glue, instead of an apple. And we are equally unable to suppose it to be a graft, for not only do we know that only nearly allied plants can be grafted on one another, while the mistletoe is extremely different from the apple, but we seek in vain for the mistletoe upon the ground. It is met only upon trees which all differ in the highest degree from it. Consequently there is nothing left for us but to suppose that the mistletoe is propagated by seed upon the tree itself, and obtains its nourishment from this." In short, it is a parasite, making another plant do its work, and thriving at its expense. The seed is peculiar in often containing two or more embryos; but, for that matter, so do many orange seeds commonly, and a long list of plants occasionally. We have found it the case in some acorns, for instance. The radicle, instead of seeking the earth, strikes for the stem of its host. "If it is the upper side of a branch, it has a tendency downwards, while if the enveloping glue fixes it to the under side, it grows upwards." Dutrochet proved that this was in response to an impulse to seek darkness, perhaps because its deeds are evil. Mistletoes may even become parasitic on each other — certainly a profound depth of degradation!

In this country we do not possess the *Viscum*, but the related *Phoradendron* and *Arceuthobium* are found in various sections, and are often very distinctive. The former grows on various deciduous-leaved trees, while the latter occurs on coniferous plants. The *Loranthus* is still another genus found in Europe.

Every one remembers the ceremonies of the Druids in connection with the cutting of the mistletoe. A good account of this and other ceremonies and traditions connected with the past, can be found in a book called *The Botanical Looker Out*.

W. W. Bailey.

A boy says, salt is the stuff that makes potatoes taste bad when you don't put any on.

I was interested in your article in May relating to the toes of birds, for I have often noticed that the Sharp Shinned Hawk, upon seizing his prey, always repairs to the ground to secure leverage, even if the victim be a young bird from the nest. My attention was especially attracted to the subject by an incident occurring about that time. A pair of Phebes had built a nest on the post-cap to my piazza, and two eggs were already deposited therein when this affair occurred.

Like their relatives, the King Birds, Phebes have a habit in the breeding season of rising high in the air, and with many tortuous winding flights and loud outcries announcing the approach of any hawk that appears in their vicinity; busy in my yard one day, I heard the Phebe's warning notes as she manœuvred upward; the old hen cackled, and the Blackbirds joined their notes of warning with hers, which ceased so suddenly as to attract my attention, and looking up I saw her struggling in the clutches of a Sharp Shinned Hawk, which immediately descended with her to the ground, and held her there in a death struggle so long a time that I went into the house, loaded my gun, and came out just in time to see the victim borne away by her triumphant captor. I had no idea before that any hawk could capture any Fly-catcher on the wing. The male Phebe, the mate of the Hawk's victim, remained in the vicinity over a week, piping his loudest notes, and occasionally going on the nest by the hour, but discouraged at last, he disappeared from the vicinity.

The Cooper's Hawk often invades my poultry yard and bears off the luckless chick straying too far from protection, but he always seizes it without pausing in his flight, and bears it away still struggling.

J. N. Clark.

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CONCHOLOGICAL CHECK-LIST. XII.

J. RITCHIE, JR.

Family. Cyclostomacea Pfr.
Sub-family. Cistulea Pfr.
Chondropoma ernesti Pfr.
eusarcum Pfr.
excisum Gundlach.
foveatum Gundlach.
fumatum Wright.
gundlachi Arango.
gutierrezi Gundlach.
harpa Pfr.
hemiotum Pfr.
hjalmarsoni Pfr.
igneum Reeve.
incrassatum Wright.
integrum Pfr.
irradians Shutt.
julieni Pfr.
laetum Pfr.
latilabre Orb.
latum Gundlach.
litturatum Pfr.
loweanum Pfr.
magnificum Sallé.
marginalbum Gundlach.
moestum Shutt.
newcombianum C. B. Adams.
obesum Menke.
ottonis Pfr.
oxytremum Gundlach.
papyraceum C. B. Adams.
perlatum Gundlach.
petitianum Pfr.
pfeifferianum Poey.
pictum Pfr.
plicatulum Pfr.
poeyanum Orb.
presasianum Gundlach.
pudicum Orb.
rawsoni Pfr.
revinctum Poey.
revocatum Gundlach.
rubicundum Morel.
rufopictum Gundlach.
salleanum Pfr.
santacruzense Pfr.
scobina Gundlach.
semicanum Morel.
semilabre Lam.
Chondropoma shuttleworthi Pfr.
simplex Pfr.
sinuosum Wright.
solidulum Gundlach.
swifti Shutt.
tamsianum Pfr.
tenebrosum Morel.
ternatum Gould.
tortolense Pfr.
turritum Pfr.
unilabiatum Gundlach.
venezuelense Pfr.
vignalense Wright.
violaceum Pfr.
weinlandi Pfr.
yucayum Presas.
Sub-family. Pomatiatea Pfr.
Pomatias adamsi Pauluce.
apricus Mouss.
auritus Zeigler.
canestrinii A. Adams.
cinerascens Rossm.
crassilabrum Dupont.
croaticus Zeleb.
crosseanus Pauluce.
dalmatinus Parreyss.
gracilis Küst.
grandis G-Austen.
gredleri Westl.
henricæ Strobel.
hidalgoi Cross.
himalayæ Benson.
lapurdensis Fagot.
lederi Bttg.
nanus Westl.
nouleti Dupont.
obscurus Drap.
partioti Moq.
patulus Drap.
penguensis Theobald.
philippianus Grdlr.
pinianus Bourg.
porroi Strobel.
protractus Parreyss.
scalarinus Villa.
septemspiralis Raz.
striolatus Parro.
tessellatus Wgm.

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TH the present number we enter upon II. of our magazine. Aware of some encies in the issue of the past year, we with greater experience, endeavor to y them in the future, and, taking great that the material presented shall be ct, we think our magazine will be ble beyond the very moderate price of ription. It contains the only reports published upon the mollusca and rep- f Rhode Island, certainly valuable to urs and students in either of those hes, and a checking-list of the cyclos- ea of the world, beside which we aim sent papers and reports on other sub- in a manner as popular as is consist- ith scientific accuracy.

those who have encouraged us by their riptions, we beg to extend our thanks.

A New Wrinkle in Taxidermy.

SHING to turn a mounted bird into a nd having but a limited time to de- o the task, I tried an experiment. g a tunnel and inserting the pointed the stuffing between the edges of the n the abdomen, I poured in a quantity water (nearly boiling hot) taking to regulate the injection so that it be rather slowly absorbed by the g, and holding the bird at various an- hat every portion of the interior might e soaked. The effect was magical; in quickly relaxed, and within fifteen es I could bend the neck and make required changes without any risk of k.

first experiment was with a gull; afterward I tried other birds, both large and small, with equal success. I found also that the plan worked equally well with skins which had been overstuffed or otherwise badly made. In a very few minutes they would become nearly as tractable as when freshly taken from the birds, and much more so than I have ever succeeded in making them by the use of a damping-box. The only difficulty experienced was that the water, especially if turned in too fast, would escape through shot holes and other rents in the skin, thus wetting the plumage in places. Of course after the required improvements or changes have been made the stuffing is so thoroughly saturated that the skin must be placed in a very warm place to dry. I dried mine most successfully by placing them on a furnace register and leaving them exposed to the full blast of heat for several days.

WILLIAM BREWSTER, *Cambridge*, *Mass.*

The Cermatia Forceps.

F. E. GRAY.

THIS insect has been reported by a number of naturalists as being extremely rare in the New England States, but, like many others, it is quite common in localities. The Cermatia is very easily distinguished from other Myriapods by its long legs and extremely long antennæ, the latter being longer than the body. In the adult specimens, the body is about an inch in length, the legs (except the hind ones) $\frac{3}{4}$ of an inch, while the hind ones are in the neighborhood of 2 inches, the total length from tip of antennæ to tip of hind legs being about $4\frac{1}{4}$ inches.

The body is of a greenish-brown color, striped with green, and the legs have three green bands around them.

It is an insect that loves the shade in the day-time, and should one by any means be forced into a place where a ray of sunlight can strike it, it will scurry back into as dark a shadow as it can find. It is found in this city in considerable numbers, and frequents the under edge of the weatherboards of houses, on the northerly side, and has been also found around tanks.

They are very voracious, and have been noticed around the electric lights in pursuit of prey. The Dryocampa senatoria seems to be their favorite food. and they will pass by our common night-flyers, and pay no attention to them, when a Dryocampa is near. They are predatory, and spring on their victim somewhat after the fashion of a spider. After once seizing their prey they will not drop it unless forced, and even then will use every endeavor to escape with it to some place of safety. They are very swift in their movements, and are difficult to capture, for while apparently motionless, when one is about to pick them up, and is quite *sure* of them, they exhibit the peculiar propensity of the flea in not being there, but somewhere else.

It is very hard work to obtain a perfect specimen, as they have a way of leaving their legs in one's hands. They are most common in the months of July and August.

PROVIDENCE, R. I., Dec. 16, 1884.

Shrewsbury's Mastodon—Mastodon Americanus.

THE remains of one of these huge creatures have just been unearthed on the farm of Mr. Wm. U. Maynard, of Shrewsbury, Mass. This being the first find in that state, is of much interest. Similar remains have been found in Ohio, Nebraska, New York, and probably some other states; and the papers have recently reported them for Rhode Island. We think this last is an error, for somewhat diligent inquiry fails to establish the location or to find any published record of the fact. A skeleton of this animal is to be seen in Boston, in Dr. J. C. Warren's collection. It is 11 feet high, 17 feet long to the base of the tail, and the tusks 10 feet and 11 inches long. Like the elephants of to-day, these animals had a large head, short neck, and a very heavy body, supported by pillar-like limbs; a long proboscis enabled them to reach the ground or the branches above them. In writing about this present find, Mr. J. A. Allen says: "These teeth belong to an animal probably about two-thirds grown, as shown by the size and condition of the teeth.

"Although the Mastodon became extinct prior to historic time, its disappearance occurred at a comparatively recent period, geologically speaking. It seems probable that it may have lived in North America, down to within a few thousand years, probably within a few centuries of the discovery of the continent by Europeans."

A Novel Mineral Cabinet.

A DEPOT in course of erection at West Medford, Mass., in the materials of its construction presents a new departure in building, and calls forth admiration from all lovers of natural objects.

The walls of the building are of field-rock with freestone trimmings. Care has been taken to select striking pieces, and they have been set as roughly as possible, the spaces between being filled with showy minerals. A large slab of slate projects at one corner, and a huge water-worn rock, resting upon it, has a striking resemblance to a bust of George Washington.

In front is a tablet for the name, and this is surrounded by twenty-four polished squares of different granites, with round balls of red granite at each corner.

A beryl crystal two feet in diameter sets on one partition, and a column of basalt from the Giant's Causeway, Ireland, projects as an example of blackness.

In the bullions between the bay-windows are large brain-corals, shells, quartz on fluor, and smaller specimens of pink gypsum, rose quartz, etc.

Other specimens are large and choice clusters of quartz crystals from Arkansas; apatite in pink calcite, Canada; geodes of quartz crystals, and chalcedony; noble serpentine; rhomb-spar; galenite; pyrite; amethyst; malachite; purple fluorite; cyanite; garnets; and polished breccia; also fossil corals, fossil wood, and ammonites.

Among the countries and towns represented by the species peculiar to them are Siberia, England, Ireland, Cuba, Mississippi, Illinois, Colorado, Pennsylvania, Diamond Hill, R. I., Middletown, Conn., Medford, Charlestown Somerville, Lynn, Fitchburg, Lee, and Newburyport, Mass., Warren and Franconia, N. H., and Sebago, Me. It will rank as one of our most notable buildings, built with novel material, and presenting an object for much study.

W. S. BEEKMAN.

Precious Opal.

SINCE the time Pliny accurately described his opalus, to the present day, this handsome mineral has been esteemed a gem, though not always assigned the same rank; for fashion, in its capricious vagaries, displaces and reinstates it in favor at irregular intervals. Its innate beauty so happily characterized in the lines,

> "Milky opals that gleam and shine
> Like sullen fires through a pallid mist,"

coupled with the fact that it is perhaps the only stone really defying imitation, has enabled it to eventually hold its own. The high rank awarded it in ancient times was undoubtedly largely due to the comparative ease with which it could be worked, and also to the fact that unlike all other precious stones much of its beauty was revealed and available without any labor. The strange popular belief of modern days that opal is an unlucky stone to the wearer, appears to be directly traceable to Sir Walter Scott's romance of *Anne of Geierstein*. In its usual occurrence in seams or veins in porphyry and igneous rocks, it is plainly an infiltration of gelatinous silica (silica in the colloid state), often mixed with considerable crystalloid silica, and retaining more or less of the originally combined water. Indeed, precious opal proper seems, as a rule, to contain more water than the other varieties. Until within the past few years the greater part of the material for commerce has been of Hungarian and Mexican origin, but a new source of supply has been discovered in Queensland. In the variety from this locality, which may in some respects be considered unique, the usual fiery reflections are displaced partly, or even entirely, by the most splendent metallic hues — greens and blues of every conceivable shade — the individual colors in some instances being arranged in more or less distinctly defined bands or zones, or again imperceptibly melting into each other and vying with the plumage of humming-birds in magnificence. —*F. W. S., in Ward's Natural Science Bulletin.*

Genera of Pteropoda from Narragansett Bay.

Editors of RANDOM NOTES:

My attention has been called to a brief notice in your magazine of the Pteropoda, or "Sea-butterflies," forming a part of the shell-bearing Mollusca of Rhode Island. I am able to add to that notice a few genera, some of which have not previously been recorded, from this locality. All of these and several more have been collected by the United States Fish Commission and have been mentioned and described by Professor Verrill, but in many instances the localities from which the specimens collected by the Commission were obtained are outside of the limits of Rhode Island waters, while all the Pteropods here recorded were found at Newport, a few hundred feet from the shore.

The value of the present list is simply as a contribution to the local distribution of these animals. A description of two young forms of a naked Pteropod is appended. I have in preparation a more extended account of the anatomy and development of New England Pteropoda, where other stages in the growth of the last mentioned genus (*Clione*) will be described.

Of the shell-bearing Pteropoda or THECOSOMATA, the following genera occur in Narragansett Bay:

Cavolina.
Cymbulia.
Styliola.
Spirialis.

The naked bodied Pteropoda or GYMNOSOMATA are represented by at least one genus and species (*Clione papillonacea*), two larval forms of which are here described for the first time.

Cavolina.

The genus *Cavolina* is found every summer at Newport. The species resembles closely *C. tridentata* Gray, and is generally captured in the night-time.

Cymbulia.

The "boat-shaped" shell of the genus *Cymbulia* was found in 1880 at Newport. This beautiful genus, one of the largest of Mediterranean Pteropoda, is easily recognized by its slipper-shaped, transparent, cartilaginous shell, with notched and serrated edges. The single specimen was dead and was thrown up on Bateman's Beach. It is probably *C. calceolus* Verr.

Styliola.

Several specimens of *Styliola*, probably *S. vitrea* Verr., have been found at Newport. Captured both by day and night.

Spirialis.

A *Spirialis* which is closely allied to *S. Gouldii* Stimpson, occurs at times in night fishing at Newport. Captured by day and night.

Clione.

The adult *Clione* I have never taken in Narragansett Bay, although two forms of the young of a species which is identified as *Clione papillonacea* Pallas, have been captured in surface fishing. Captured by day and night.

Stage 1.

The youngest stage of *C. papillonacea* was taken at 10 A. M., and was at first regarded a worm larva. It was later recognized as the young of Stage 2, which is undoubtedly the young of *Clione.*

The body is ovate, blunt at the anterior and more pointed at the posterior pole. Its length is 2.5 mm.

Four well-marked regions are found in the body, which is girt by four rings of cilia. Of these body regions the third, counting from the anterior, is the largest and the most posterior the smallest. The anterior or cephalic has a cup-shape, upon the posterior rim of which there is a ring of cilia, and on the top an infolding. It is separated from the second by a deep constriction just below the ring of cilia.

On each side of the median line extending backward over the anterior portion of the second body region, hang down two finger-like projections which are the beginnings of a heart-shaped organ, often called a "foot," found in that position in the adult.

In a side view one of the finger-shaped bodies last mentioned is seen in profile. From the constriction just below the first ring of cilia under this finger-shaped body, the rudiments of the future "wings" of the Pteropod appear as little buds, one on each side.

The second and third body regions, which together make the greater part of the body, have the form of swollen cylinders separated from each other by ciliated belts, the second ciliated ring of the larva being placed on the anterior border of the segment which is second in order of enumeration, counting the head as a segment. The maximum diameter is just below the third ring of cilia. The terminal body-segment is pointed. conical, tipped by a tuft of cilia or a flagellum. The whole body of the larva is filled with large spherical globules.

Stage 2.

A second stage, intermediate between that just described and the adult, shows that both may rightly be referred to *Clione papillonacea.* It has the head much more rounded and the body more conical, tapering regularly backward to the posterior pole. In this larva one belt of cilia only was seen, viz.: the small ring which is placed near the posterior end of the body, or between it and the third body segment. The head bears two short tentacles, one on each side of a median line in which lies the mouth. The chitinous teeth are well developed. The walls of the head are covered with small papillæ. The two finger-like projections mentioned above have. consolidated and formed a heart-shaped organ, the outlines of which are similar to the form of the same in the adult.

The constriction below the head in the earlier stage has broadened, and the two wing-like flappers which move so rapidly and which give the name of "sea-butterflies" to the group, have become very prominent. They are very thin and delicate, crossed by a muscular net-work of exquisite fineness.

Just below the heart-shaped organ lies a median tooth, an unpaired projection pointing backward. The whole surface of the body-walls is covered with minute papillæ. The walls are translucent, and in the body cavity at the greatest diameter, just below the wings, a globular mass more or less opaque, brown on one side and red on the other, can be easily seen. The posterior extremity of the second stage is formed of a very small segment separated from the remainder of the body by the persistent ciliated belt. This region has a bright red color.

The stage of *Clione* just described was taken in nocturnal fishing. Its length is 5 mm. J. WALTER FEWKES.

CAMBRIDGE, Nov. 11, 1884.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER IV.

9. *Chelopus insculptus* (LE CONTE) COPE. (*Glyptemys insculpta* AGASSIZ.) The Sculptured or Wood Tortoise is found abundantly in our rivers, and is often surprised in pastures and woods some distance from any water whatever. When thus found it is leisurely crawling along, or feeding on the leaves of some favorite plant, until, disturbed, it suspends its labors and meets the intruder with hisses of defiance. On examination the shell is seen to be composed of very distinct, concentrically sculptured and brown-rayed plates; a prominent ridge being formed along the back by successive longitudinal prominences. Below, the yellow plastron is divided into twelve portions, each bearing in its posterior and outer corner a large black blotch, around which is a series of suture-like grooves, parallel with the general contour of the plate. The lower side of the limbs, neck, and tail presents a most beautiful orange color, well blending with the other shades of the body. In size the Sculptured Turtle sometimes rivals the "Snapper," specimens having been captured whose shells measured nine inches in length, though they seldom exceed seven or eight. This species is peculiar in its distribution; while I have found them very common about the Androscoggin River, in Maine; in Massachusetts, around Boston and Plymouth, they are rare, though in Worcester County they are very abundant.

10. *Emys meleagris* (SHAW) COPE. (*Cistuda Blandingii* HOLBROOK.) This species is very rarely found in New England, though abundant in its regular habitat, the prairies of Illinois and Wisconsin. A specimen captured in Seekonk, Massachusetts (but a short distance from Rhode Island), by Mr. William Olney, is, above, of a dark green color speckled with yellow, the shell being convex, rounded, and smooth. Below, the shell has much the coloring of the Sculptured Tortoise, though it lacks the deep notch at the anterior portion, and is chiefly different in that it is provided with longitudinal ligamental hinges, which connect it with the carapace; and a transverse hinge, which separates the six anterior plates from the six posterior. By means of these hinges the turtle, having drawn its extremities beneath the shell, is enabled to further protect them by closing the "lids" of the plastron. In size it considerably exceeds the following species.

11. *Cistuda Carolina* EDWARDS. (*Testudo carolina* LINN., *Cistudo virginea* AGASSIZ.) The common Box Tortoise is abundantly found in pastures and uplands, while seeking its food of "toad-stools" and "mushrooms." In coloration this species shows great variety, though there are constant structural characters. The first four vertebral plates are keeled; the general margin of the plastron is entire with no deep notches, and has the hinges placed as in *Blandingii*, though better developed, enabling the animal to completely enclose itself in its shell. The upper mandible is not provided with the notch which characterizes the previous species. The shell measures between six and seven inches in length, and four inches in breadth.

The Box Turtle, unlike our other chelonians, has an especial dislike for the water, and soon dies if placed in it. As regards its breeding habits, I can learn nothing.

The longevity of turtles is remarkable; they seem to live until put to some violent death. Nearly all collected show signs of great age, and often those are captured which carry dates almost incredibly old. A venerable Box Turtle, in the town of Middleboro, Mass., was recently seen which bore dates of the latter part of the last century, as well as successive dates of this. There have since been five generations in the family of the one who first carved his name on the plastron of this respected resident.

Strange Behavior of a Blue Jay.

MR. J. W. BYSKIT, of Michigan City, Ind., writes: "Passing along the street a few days ago, my attention was drawn to a flock of English sparrows. They were making a great outcry, and upon closer observation I saw a blue jay had pounced on the flock and had secured one of them in his feet. He flew into a high tree near by, still holding on to the sparrow. Was it a case of pugilism on the part of the jay, or did he want the sparrow for food?"

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XII.

FAMILY 22. Calyptræidæ, Gray, containing twelve genera and more than one hundred species, is represented in Rhode Island by five species, as below. The Calyptræidæ, or Slipper limpets, are found adhering to rocks, or under stones, on both living and dead shells of other species, and to each other, from low water to forty fathoms. They are numerous and widely diffused, but reach their perfection in the tropics, where they attain considerable size and are remarkable for their peculiar forms and the richness of their colors. Like the oyster, when first born they are free to move about and select a place to settle, from which spot they never move again. They adapt the form of their growing shells to the inequalities of the surface on which they may be fastened.

GENUS CRUCIBULUM, SCHUM., 1817.

Shell sub-conical; aperture wide, with a cup-shaped appendage within, attached on one side to the inner wall of the shell.

SUB-GENUS DISPOTÆA, SAY. (CALYPEOPSIS, LESSON.)

24. CRUCIBULUM (DISPOTÆA) STRIATA, SAY.

Syns.:

Calyptræa striata, Say, *J. Ac. Nat. Sc.*, Phila., v., 216, 1836.

Crucibulum striata, H. & A. Adams, Genera, I., 366, 1858.

Shell oval, convex, covered with numerous equidistant, radiating lines; apex subacute, wax-yellow in color, turned a little to the left side and to the posterior end. It has a cup-like process within, attached by one side to the shorter side of the shell. Length four-fifths of an inch. Distribution, from New Jersey to the Bay of Fundy. (Verrill and Smith.) Northern N. J. (Say.) Gardiner's Bay and Montauk Point. (S. Smith.) Vineyard Sound and Buzzard's Bay, 3 to 12 fathoms. (A. E. Verrill.) Mount Desert, Me., 3 to 10 fathoms, common, and Bay of Fundy, low water to 30 fathoms, common. (A. E. V.) Whole coast of New England. (Stimpson.) I have never found it in R. I.

GENUS CREPIDULA, LAM., 1799.

Shell oval, arched, boat shaped, with a spiral apex pressed against the margin; interior with a horizontal partition covering its posterior half.

25. CREPIDULA CONVEXA, SAY.

Syns.:

Crepidula glauca, var, Say, *J. Ac. Nat. Sc.*, Phila., II., 226, 1822.

Crepidula acuta, H. C. Lea, *Am. J. Sc.*, XLII., 108, 1842.

Crepidula convexa, Say, *J. Ac. Nat. Sc.*, Phila., II., 227, 1822.

Shell very convex, the var glauca not so much so, color from greyish-green to dark brown; apex acute, separated from the body of the shell; within, shining, dark brown; aperture oval with a diaphragm across, occupying less than half the interior, leaving a deep cavity extending to the beak; diaphragm brown, the free edge white. Length half an inch, breadth a little less. Distribution, Massachusetts Bay to Florida, common; less abundant and local to Gulf of St. Lawrence. Very abundant in Rhode Island on stones and on small univalve shells, such as Ilyanassa obsoleta, etc. The var glauca is found on broad and flat surfaces of stones, and larger bivalve shells. Mya. Pecten & Ostræa.

Gould says (*Invert. Mass.*, 273, 1870.) it is found on sea-weed, but I have never found it so, excepting a few very small, young specimens.

26. CREPIDULA FORNICATA, LINN.

Syns.:

Patella fornicata, Linn., Mart., Lister, Knorr.

Crepidula fornicata, Lam., Say, DeKay, Stimp., Gould.

Shell oval, but with one side more oblique than the other; apex prominent, turned a little to one side, not separate from the margin, externally dingy white, figured with chestnut-colored lines, and the whole surface covered with a yellowish epidermis; aperture sub-oval, the edge simple and entire, color light brown; diaphragm white, occupying one-half the aperture, one side appressed to one side of the shell, the other defined by a distinct line, the free edge waved. Length about one inch and a half, breadth one and a quarter or less.

This shell is very common in Rhode Island, and is known by the popular name of Cuddy-boat. Its distribution is from Cape Cod south to Florida, and the northern shores of the Gulf of Mexico. North of Cape Cod it is local and not abundant to the Gulf of St. Lawrence. It is found in the miocene of Maryland and the Carolinas, also semi-fossilized at Nantucket and other places along the coast. The shells are found adhering to stones, to the surfaces of oysters and scallops, and to each other. When found on scallops they are ribbed correspondingly to the ribs of the scallop. Sometimes five or ten are found of various sizes riding upon each other, the largest at the bottom and graded according to size.

Genus Ianacus, Mörch.

Shell depressed, apex posterior, but slightly lateral, lamina mostly concave in front.

27. Ianacus, plana, Say.

Syns.:

Crepidula plana, Say, Gould, DeKay, etc.

Crepidula unguiformis, Stimpson, Perkins (non Lam.).

Ianacus plana, Dall.

Shell ovate, flat, as often concave as convex, white, thin, sub-transparent; apex minute, pointed, terminal; interior white, polished, iridescent; diaphragm convex, less than one-half the length of the shell. Length one inch to one and a half, breadth nine-tenths. Its common habitat is in the interior of the dead shells of other species. In dredging we almost always bring up dead shells of Sycotypus, Fulgur, and Naticas, inhabited by the hermit crab, and the interior of the shell lined with numbers of living Ianacus plana. Gould says, (*Invert. Mass.*, p. 272,) "it is found in the apertures of other shells," but it is also found on the outside of oysters and other species, and occasionally on stones. It inhabits the whole Atlantic coast of the United States, but it is not common north of Cape Cod. Its shape is very variable, as it conforms itself to the inequalities of whatever surface it may be attached.

Lamarck, in his remarkable work, *Les Animaux sans Vertebres*, Vol. VII., p. 643, described a shell from the Mediterranean Sea as Crepidula unguiformis, a shell greatly resembling, but distinct from ours, and Stimpson and many other American authors have supposed it to be the same, and have given our shell the name of unguiformis, because Lamarck's name has the precedence by right of priority, but as it is not the same species, Say's name should be accepted as correct.

The three species described above, viz.: plana, fornicata, and convexa, together with the variety glauca, which was described as a distinct species, were discovered and named by Thomas Say, and their descriptions published in the *Journal Acad. Nat. Sci.*, Phila., II., 225 to 227, July, 1822.

One other species only of this family has been found near our coasts; it is the Capulus Ungaricus, Linn. A E. Verrill says, *Cat. Mar. Moll.*, 519, 1882, "Two living specimens were obtained in 1881, which appear to belong to this species. They are more delicate and have somewhat finer and more regular radiating ribs than the ordinary European form." Off Martha's Vineyard in 69 and 458 fathoms. Its habitat is Europe, from Iceland to the Mediterranean.

(To be continued.)

Ferns.

In one of the journals of the American Philosophical Society, Mr. Davenport credits New York State with being the habitat of 52 species, California 48, Arizona 47, Florida 47, Michigan 47, Vermont 45, Pennsylvania 44, Kentucky 42, Massachusetts 42. Twenty-four species are confined to Florida, and Schirzata to New Jersey. Pteris aquilina is found in thirty-nine of the states and territories. We desire to add, for Rhode Island, nearly forty species, including varieties. The rarest are Camptosorus rhizophyllus, Woodwardia augustifolia, and Pellæa gracilis. Woodsia Ilvensis is also scarce, and Struthiopteris has never been found in fruit within our limits.

A little boy in Georgia, who wrote to Santa Claus for a pony, was wise enough to add: "Poscrit: If he is a mule, Ples ty his behine legs."

CONCHOLOGICAL CHECK-LIST. XIII.

J. RITCHIE, JR.

Family. Cyclostomacea Pfr.
Sub-family. Realiea.
Realia abbreviata Pease.
acutilirata Pfr.
affinis Pease.
angulata Mouss.
aurantiaca Deshayes.
bachmanni Grdlr.
bankaensis Mouss.
bifilaris Mouss.
bilirata Mouss.
boraborensis Dohrn.
borneensis Mouss.
bulimoides Hombron.
caledonica Cross.
cattaroensis Pfr.
ceramensis Pfr.
cerea Pfr.
cheneyi Dohrn et Semp.
circumlineata Mouss.
clavulus Morel.
conica Troschel.
conoidea Mouss.
costata Pease.
costulata Mouss.
coturnix Cross.
distermina Benson.
dubia Pfr.
egea Gray.
elongata Mouss.
erosa Quoy.
expansilabris Pfr.
exquisita Pfr.
glabrata Pfr.
globosa Benson.
granum Pfr.
gutta Shutt.
hieroglyphica Fer.
huaheinensis Pfr.
longula Mouss.
major Morel.
malleata Pfr.
maritima Montrz.
moussoni Pease.
multilirata Pfr.
navigatorum Pfr.
nitida Pease.
Realia obscura Mouss.
ochrolenca Pease.
ochrostoma Pease.
ovata Pease.
pallida Pease.
parva Mouss.
parvula Mouss.
perforata Mouss.
picturata H. Adams.
plicosa Pfr.
producta Pease.
pupoides Anthony.
pyramis Pfr.
radiata Pfr.
rangii Pot. et Mich.
robusta Pease.
rosea Gould.
rubella Pfr.
rubens Quoy.
rubra Gass.
scalariformis Pease.
scitula Gould.
sirki Parreyss.
solidula Pfr.
subsoluta Mouss.
subulata Mouss.
tahitensis Pease.
terebralis Gould.
turriculata Pfr.
turbinata Morel.
vallata Gould.
variabilis Pease.
variegata Morel.
ventricosa Jacquinot.
viridescens Pease.
zebriolata Mouss.
Optediceros marginatum Leith.
rotundum Fairb.
subconicum Leith.
Cyclomorpha biangulata Pease.
flava Brod.
Cecina manchurica A. Adams.
Belongs here rather than in Check-list I.

Sub-family. Bourcierea Pfr.
Bourciera fraseri Pfr.
helicinæformis Pfr.

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WE desire Nos. 1 and 2, of Vol. I. To any person sending either of the above in good condition we will send RANDOM NOTES for six months, or if already a subscriber will add six months to his subscription.

The Night Heron.

I PROPOSE writing a few words about this real curiosity — one of nature's oddities.

He belongs to the family of wading birds, and seems to enjoy nothing better than to fill his crop with frogs, beside a reedy pond on a moonlight night, and his powers of digestion are something astonishing.

While out collecting eggs, my brother, guided by the noise which could be heard at some distance, came upon a heronry. After floundering through mud, and vaulting slippery logs, and crawling on hands and knees for half a mile she came where hundreds of these birds had built their nests in the trees — a cedar swamp — and the nests, built of sticks and placed in the forks, could be seen in every tree. Many contained young, and they were such long-legged and ill-shaped creatures that he concluded to take a couple home. They bit and scratched, and made more noise than an army of ordinary fowls. One was partly fledged, the other poorly covered with thin down. On arriving home he found his treasures troublesome; they required constant feeding. So he gave the larger one to me and the other to my brother Willie.

I called my bird Tommy. He was not in the least bashful about letting you know he was hungry, and sent forth his persuasive calls in a peculiar cackle, which he kept up incessantly, and it was indeed a strong-minded person who could long listen to it without wishing he would stop.

I started off, and in about an hour came back with a dozen frogs and three good-sized fish; — enough rations, I thought, for a week. I was surprised to find Tommy sitting up on his straw with a very contented look on his countenance, and quiet as a mouse. Some one must have fed him. But where was Willie's bird? He was nowhere about the room. But what could that be, sticking out of Tommy's mouth? I looked closer. Good heavens! it was the toes of Willie's bird. His hunger had got the better of him, and he had bolted the companion of his youth and the sharer of his joys and sorrows. I stood in blank amazement, and when the ludicrous side of the scene presented itself, I burst into laughter. Willie came to see what I meant by such unusual mirth, and I shall not soon forget the look on his face when he saw the toes hanging out of Tommy's mouth. He did not see anything to laugh at. "It wasn't his place to laugh."

"Never mind," I said, "this is a decided improvement. We now have them both in one bird. We will go into partnership; for if Tommy goes on at this rate, it will take all the time of one active man to get him food." Willie thought he could transfer his affections to Tommy, so we made him a nest in an old chicken-coop, where he could go and come as he pleased. We used to bring him fish, frogs, snakes, and all sorts of living things to eat, and it would have done a dyspeptic good to see him dispose of them. He used to swallow most of the animals alive, and if you wished to laugh until your sides ached, it was only necessary to give him a good-sized snake, and watch proceedings. He always came off victor, but I think it must have been a tuckering operation, for he looked, when he had forced the snake down the last time, and the internal wriggling had ceased, as if he was quite exhausted. Frogs, half the size of your fist, went down his capacious maw one after the other, like water down a spout, and it was not until the legs of the last one were left dangling out of his mouth, that he began to think of stopping. I once gave him a large hornpout. I had heard before of getting outside of your dinner, but never expected to see it so well illustrated. Of all the gulpings, twistings, and wrigglings I ever saw, that capped the lot. He could not swallow it all, and after he had worked industriously for a quarter of an hour, he laid down on the grass at full length, fish and all, to let nature digest enough so that he could swallow the rest. We had a stuffed duck, and put it in the coop to keep him company. He was very fond of it, and one day broke off the head and put it down to keep company with the other things that had gone that way. A wonderful change came over him for a day or so. He ate nothing. Poor Tommy! his last days were near. I wonder if he had any regrets for his life of gluttony and dissipation. I expected to find him dead on my next visit, but instead found in the coop the duck's head, disgorged on account of the arsenic on it, which was too much for his complexion, and Tommy was chasing the chickens around the barn, for he was fearfully hungry, having lived on nothing but stuffed duck for two days. As he grew older he killed his food before swallowing it. I think he found that to have it jumping around after it was down was gradually deranging his internal mechanism, and scattering seed of indigestion liable to cause him regret in after life. When he was old enough to fly, he decided that rather than try to live on scanty rations, such as three frogs, two fish, and a snake or two daily, he would start on his own hook, and by dint of hard labor "keep the wolf from the door."

He would sleep part of the day and then start for the brook. One day, while upon one of these excursions, he met my friend Jones fishing in the brook. No sooner did Jones pull out a fish, than Tommy made a swoop from the top of a tree, and before Jones had time to be surprised, had gobbled down fish, hook, and sinker, and stood waiting to "do so some more." Jones gathered in his slack line, and then commenced to pull Tommy in, who began screaming, fearing he would lose his dinner. Jones was astonished and somewhat frightened. He pulled in as much line as seemed advisable under the circumstances, cut it off, shouldered his pole, picked up his string of fish, and started for home. No sooner did Tommy see the fish than he made a rush for them, seized one, and pulled it off the string. This completely unnerved Jones, and he dropped the rest and had the satisfaction of seeing them all slide down that capacious gullet. There was a maiden lady living near us, and one morning when she went out to feed the chickens, Tommy was sitting in a tree near by making a great racket, for he was hungry. She kindly got him a piece of meat, and down he came in great haste, and got hold of the meat, along with two of the lady's fingers. She screamed, and made tracks for the house, Tommy meanwhile shutting down on her fingers like a steel trap. A boarder at the house came to the rescue, and between them they managed to get him off, when Tommy went home, doubtless feeling as if he had been swindled.

No matter how much he ate he never grew fat. Somebody said it made him poor to carry around all he consumed. He was not naturally quarrelsome — he was too busy devising means of subsistence — but self-defence came natural to him, and he did not know what fear meant. We had a fine large rooster, well spurred, and as proud as a king; the hero of many a battle. Tommy's singing was too classical for him. (It was for most of us.) So he marched up in an important manner, and pitched in without more ado. Tommy evidently thought the long-looked-for dinner had arrived. He seized the rooster by the head, and began thrashing him around in a truly fearful manner. He thought 'twas another big snake, that needed all his attention. When Tommy let go it was painful to see our crestfallen fowl. He slunk into the barn, as fast as his dizzy brain would allow him, and under the straw moped away the rest of the day, recuperating and repenting of his rash act. Pets of this kind usually come to a sad end, and Tommy was no exception. One night, about eleven o'clock, while trying to awaken sympathy by his cackle, he received a dose of cold lead. His stomach rebelled at this, and, with a shriek, he fell dead. We planted him in the garden, with a shingle to mark his resting-place. S. F. Denton.

R. I. Entomological Society.

The subject of the lecture by Professor Packard before the Society on Wednesday evening, Jan. 14, was "Spiders." There are about eight hundred species known and described in the New England States, of which the type is our common garden spider. We see its web in the corners of rooms, on shade trees and shrubbery. The male is seldom seen. The eyes are eight in number, situated on the top and front of the head. The jaws are very powerful and contain the poison which is situated in a sac at the base, and is forced through a duct by pressure when anything is bitten, and forced out into the wound through minute openings at the end of the nippers. The bite is deadly to all insects, but there is a question whether it is harmful to the human family. Professor Heintz, who was considered authority on the subject, having studied them for years, claims that the bite is harmless, having caused them to bite him in different parts of the body at various times with no evil results.

But there is a species of large ones (Lathodectes) in Alabama, which has been reported as having caused the death of a number of persons. In Italy it is a common belief among the ignorant that the bite of the tarantula produces an uncontrollable desire in persons bitten to dance until they drop from sheer exhaustion.

One species of the tarantula, genus Lycosa, is quite common with us, is large and black, but spins no web. It lives in holes in the ground and has the art of gathering small leaves and forming a sort of ball, fastening them together with silk, and placing it over the nest as a protection.

The spinning glands are six in number. The thread is of fluid form until it reaches the air, when it hardens into silk, and is formed by each spinnaret uniting its contents with the aid of the feet, thus forming a single thread. In October, the young of our common spinning spiders can be seen floating over fields and gardens, often at a great height. They stand on their fore legs, elevating the hind body in the air, and draw out the silk with the hind legs, letting it float in the air until there is enough to float them with the aid of a light breeze.

The trap-door spider, or mygale, is found in the southwest United States. It is very powerful. The trap is made in the ground, with the door flush with the surface, made to open and close by means of a hinge.

Tourmaline.

Rhombohedral: Hardness, 7 to 7.5; Gravity, 2.9 to 3.3. Is composed of silica, alumina, and boron, with some magnesia, and perhaps a fraction of iron or lithia, and is one of the most interesting minerals in the world, on account of the facets of termination often varying at opposite ends of a crystal, and the fact that specimens dislocated and curved are not infrequent; also for the property of dichroism, which is well described in "The Tourmaline," by Dr. A. C. Hamlin, who says: "Some of the prisms, when viewed parallel to their axes, appear of a splendid crimson hue; but when the prism is slightly turned, the red color vanishes as if by magic, and the stone becomes white, or smoky, or green. Other crystals are green when viewed transversely and yellow-brown axially, or dark violet transversely and green blue axially." All specimens do not, however, possess this property.

The high-colored and transparent crystals often present in their length much diversity of color, such as deep red at one end and light pink or white at the other; or perhaps red and green, with beautiful gradations where the colors shade into each other; while others viewed at the ends, prove to be pink or red at the centre, and green outside, as if the red had been first made and then the green rolled around it. Those found at the Chesterfield, Mass., locality, are often of this sort, while those from Paris, Me., are world-renowned, and exhibit all of these wonderful peculiarities.

We must not forget to note also the electrical properties, which, when a crystal is heated, are negative at one end, and positive at the other, generally positive at the end with the greatest number of facets, and this state, says Dr. Hamlin, "may be reversed by intense cold." If one of the prisms be broken while in an electric state, excited by heat, the fragments present opposite poles, like artificial magnets. It is shown that, if heated somewhat above 212° Fahrenheit, it loses its electricity; but, if the increasing heat is continued to a certain degree, it again becomes excited; but the electrical poles are reversed.

Schorl, is a synonymous term, applied particularly to the black variety, also called aphrisite. Rubellite, sibarite, and daorite are applied to the red varieties, achroite to white, and indicolite to the blue, sometimes almost black varieties, like those found at Chester, Mass.

Near Warwick, Mass., is a deposit of schist, containing accicular black crystals, about half an inch to an inch long, arranged here and there in groups; radiating from a centre in beautiful figures. Lately, fine colored specimens have been found at Hebron, Auburn, and Norway, in Maine. * Work has been carried on at Mount Mica, Paris, Me., and the yield for 1882 was something over 2,000, while colorless and brown specimens which cut into fair gems have been found at De Kalb, N. Y. The groups (black) from Pierpont, and the fine brown brilliants from Gouverneur, with peculiar terminations, are opaque, and have no value as gems.

The principal foreign localities for transparent specimens, are: From Siberia, a great variety of colors; Brazil, purple, green, and blue; Ceylon, green, yellow, brown, and black; the Isle of Elba white, and light or delicate tints, frequently pink. A fine group of pink crystals, on a matrix of amethyst, now in the British Museum, came from Burmah, and is valued at £1,000 sterling.

Tourmalines are found in granyte, syenyte, feldspar, granular dolomite, and imbedded in sheets of mica. The black variety, which is the most common, sometimes occurs quite massive, and looks much like hornblende, from which it may be distinguished as having no exact cleavage, nor fibrous appearance, and if the end of a crystal can be seen, its triangular shape is significant of the tourmaline.

Specimens of the black sort, but of rather poor quality, have been found in Rhode Island, at Johnston, and Woonsocket. S.

What is meant by the bone of contention? The jaw-bone.

Rodentia of Rhode Island.

Tamias Striatus. Chipmunk: Striped or Ground Squirrel.

This little fellow is common throughout the state. Not much hunted for, being such small game; always pursued by boys and dogs, and yet by no means shy, but rather inquisitive. If you stop a few moments in his vicinity, he is sure to come peeping at you from under a stump, or from a pile of rubbish. With an interrogating chirp, that sounds very like a bird, running from you as you walk, making long bounds, he disappears in the stone wall, and immediately pops out his head again, to view the situation and satisfy his curiosity. When a very small boy, in Massachusetts, I once chased a chipmunk along a fence-top. Putting all my energy into the work, I gained on and seized him, but only by the tail. He did not stop, and the skin giving way, suddenly left me, astonished, with the mite of skin and hairs in my hand, while the owner disappeared with his rat-like appendage. I am sorry to this day.

The home and nest is a hole about two inches in diameter, usually running beneath some firmly-rooted tree or a stone wall, and there he lays up a large store of food, mostly of corn, chestnuts, and shagbarks, with sweet acorns and beech-nuts when they are to be had. In gathering this store the autumn days are spent most industriously. Early and late he is running with his cheek pouches distended most amazingly — often four nuts at a time in that small mouth. The entrance to the home is always perfectly clean, and no sign of loose dirt, which he must carry away to some distance. Any sort of grain does not come amiss for food, nor are the seeds of grass and small plants despised, and in the summer, berries, larvæ, and grasshoppers. In the spring, at corn planting, he will most industriously go from hill to hill, and clean out the first two or three rows next to the stone wall, much to the annoyance of the farmer. He retires to his hole with the first cold weather of November, and, except for an occasional escapade, does not appear again until March.

One that I kept in captivity, though handled with care and well fed, remained very wild, and was continually escaping and

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* *American Gems and Precious Stones*, by Geo. F. Kunz.

getting into all manner of forbidden places, much to the disgust of madame. I was obliged to let him go.

There are probably four young to a litter.

His length from nose to tail is 6 to 6½ in.; tail 4 to 4½ in.; chin and all under parts white; nose light tan with a narrow, medium, dark-brown line, two lines each of tan and dark-brown from the nose, through the eye, to the ear; sides tan color, hairs gray at roots, crown rufous mixed with black; posterior parts rufous brown; dorsal stripe black edged with rufous, with parallel stripes on either side, first gray and brown mix, then rufous brown, black, yellow-white, and black again; tail very narrow and mixed in color, the hairs being colored in bands of dark and light brown, two each. S.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER V.

II. ORDER—SAURIA. The actual occurrence of a single representative of this order within the limits of Rhode Island has yet to be recorded, though there can be little doubt of the ultimate capture of at least one or two species of forms so extremely abundant further south.

Though the Lizards (*Saurians*), as has been already said, pass so gradually into the *Ophidians* that definite lines of demarcation can with difficulty be drawn, the following points will assist to separate the closely-related orders:

The lizards have the bones of the head well joined together; the lower jaw is also united in front, preventing that lateral extension so universal among the ophidians. As a rule lizards are provided with eyelids, and the ear opens direct, *i. e.*, is not covered by the skin of the head. The most important characteristic, however, is the possession of limbs, though in some forms they are extremely rudimentary.

As regards the two lizards possibly inhabiting the state:

(1.) *Eumeces fasciatus* LINN. (*Plestiodon fasciatus* D. & B., J. A. ALLEN'S REPORT), or the Blue-Tailed Lizard, is about seven inches long. The head and body of a deep bluish black above, and white below. Running from the anterior part of the head are six yellow stripes, the two dorsal of which unite at the occiput, the one thus formed passing along the middle of the back to the tail, where it changes to a beautiful blue color. The other four stripes change in the same manner, after having gone the length of the body parallel with the dorsal one.

This harmless little animal, though extremely rare in New England, is very generally distributed east of the Mississippi, and as far south as the Gulf of Mexico. In early morning, while tearing the bark from partially decayed trees, in Louisiana, I have surprised them numb and inactive, though later on in the day it was with difficulty that a single specimen could be captured, so lively would they become.

(2.) *Sceloporus undulatus* HARLAN. (*Tropidolepis undulatus* HOLB.) The common names applied to this form, so abundant throughout the central and southern portions of the country, are amusing. The "Brown Swift," indicative of the color and the rapidity with which it scurries away on being disturbed; the "Pine Lizard," because of its preference for pine woods, often climbing to the tops of the highest trees; "Alligator Lizard," from a fancied resemblance to that giant saurian; but why the harmless little animal should be called a "Brown Scorpion," is beyond conjecture. This lizard differs from the previous in having the body much depressed, the scales of the upper side strongly keeled, and in general marking; the "Pine Lizard" having the back marked transversely by dark brown and black waving lines, and the abdomen with longitudinal stripes and blotches.

The two representatives of the order Sauria thus treated are probably the only forms that will be found to inhabit the state. The first has been captured a few times in Massachusetts, and the second in Connecticut. There is no good reason, however, for their not having been already recorded; in fact, the warm lowlands around Kingston and Point Judith must offer extremely favorable conditions for these apparently rare forms. If our museums and collectors would turn their energy towards working up the natural history of their own localities, rather than with making fragmentary displays of exotic faunæ, their results would be of much more practical value.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XIII.

FAMILY 23. Onustidæ. A peculiar family of mollusks called "carriers," from their habit of cementing fragments of shells and stones to their outside surfaces, inhabiting the tropics.

FAMILY 24. Solariidæ, also tropical.

FAMILY 25. Scalaridæ Gray, contains but one genus, Scalaria, with about 150 species, mostly tropical, although a few inhabit the colder waters, even to Greenland.

GENUS SCALARIA, LAM.

These shells are called by the English, wentle-traps, and by the Dutch, winding-stairs, from the step-like ring ascending spirally up to the apex. The species all resemble one another very closely, and are nearly all pure white in color, and lustrous. The Spaniards at St. Blas wear them for ear-rings. They are quite rare, inhabiting deep water. The type of the species and the most beautiful of them all is the Scalaria pretiosa, Linn., which used to be sold for $200 per specimen, but can be bought now for $1 and upwards, according to size and perfection. The animal is carnivorous, and when disturbed emits a purple liquid. Three species are found in New England, namely:

28. SCALARIA LINEATA, SAY.

Shell conical, pointed, white; whorls, eight, rounded, traversed by sixteen to eighteen ribs, not crossing the suture; a raised line originating from the junction of the lips revolves on the lower whorl, and defines the upper edge of a reddish-brown revolving band; aperture round, with a strong, white lip; no umbilicus. Length one-half inch, breadth one-fifth. Found by Mr. C. F. Shiverick, at New Bedford. Buzzard's Bay, southwards (Stimpson). Vineyard Sound and Long Island Sound (Verrill). Rare at New Haven (Perkins). New Jersey to South Carolina and Georgia. Described by Thomas Say, *Jour. Ac. Sc.*, Phila., II., 242, 1822.

29. SCALARIA MULTISTRIATA, SAY.

Shell white, solid; spire acute; whorls eight, very convex; suture moderate; ribs from fourteen to twenty, equidistant, moderately elevated and rounded on the edges; the spaces between the ribs marked with microscopic revolving lines; aperture ovate, one-fourth the length of the shell, margined by a rib; umbilicus, none. Length one-half inch, breadth $\frac{4}{10}$. Dist., Massachusetts to Florida. Dartmouth Harbor and Buzzard's Bay (Shiverick). New Haven (Verrill and Dr. E. T. Nelson). Living and semi-fossil in South Carolina. Described by Say, *Jour. Ac. Sc.*, Phila., v., 208, 1822.

30. SCALARIA GROENLANDICA, CHEMN.

Syns.:

Scalaria planicosta, Kiener.
" subulata, Couth., DeKay.
" Groenlandica, Sby., Gould, Stimp.

Turbo clathrus Groenlandicus, Chemnitz, *Conch.*, XI., 1878, 1779.

The distribution of the two species above described is southern, and few specimens are found here at its extreme northern limit, but this species is northern, extending to the Arctic Ocean, and is rare here at its southern extreme. It also extends eastward from Greenland, Iceland, etc., to the shores of Europe, southward to Bergen. Nahant Beach, and taken from fishes caught in Massachusetts Bay, and at the Grand Banks, abundantly (Gould). Eastport (Cooper). Off Egg Rock, seventeen fathoms (Haskell). Nova Scotia (Willis). South Shoals, off Nantucket (Agassiz). Fossil, Beaufort (Dawson), and in Great Britain. It has been dredged in Block Island Sound, seventeen to twenty-four fathoms.

Shell turreted, tapering to a pointed apex, of a dead, bluish-white color; whorls ten, with eight to fifteen stony, flattened, oblique white ribs, the intervening spaces crossed by coarse revolving lines; aperture nearly round; umbilicus, none. Length one inch, breadth one-third.

FAMILY 26. Ianthinidæ, Gray. This family contains two genera, Ianthina and Recluzia, and one fossil genus, Scalites, Conrad.

GENUS IANTHINA, LAM.

This genus, spelled by some authors Janthina, contains ten species, inhabiting the Atlantic and Pacific oceans. The only species ever liable to be found in Rhode Island is the Ianthina fragilis, as stated in RANDOM NOTES, No. III., p. 7.

31. IANTHINA FRAGILIS. DESH.

Syns.:

Helix ianthina, Linn., and all the older authors.

Ianthina communis, Lam., Lister, and others.

Ianthina fragilis, Desh., Bl. Sby., DeKay, Stimpson, etc.

Shell very thin, translucent, helix shaped; whorls three or four, forming a short spire, body whorl large, angular at the centre; below this angle the shell has a beautiful deep violet color, above it it is pale, almost white, except at the suture, where it is tinged with violet; aperture large with no operculum; outer lips very thin, waved; inner lip straight, forming an axis through to the apex. Length four-fifths, breadth one inch. These shells are called the violet snail and oceanic snails; they inhabit the open ocean, are gregarious in their habits, and float upon the surface, sleeping by day and feeding at night upon the small blue jelly-fish in immense numbers, from which they probably derive the coloring matter of the shell. They float mostly in the Gulf Stream, with the under part of the shell up, and attached to the foot is an appendage three or four inches in length, consisting of a jelly-like substance filled with air bubbles, on the under side of which are attached their eggs. As this appendage is too large to be withdrawn into the shell, an operculum would be of no use, and as they have no power to rise or sink in the water, they are at the mercy of the winds and waves. For this reason after a westerly storm they are found on the shores of the British Islands, and after an easterly gale, on the New England coast. In 1839, after a severe gale, great numbers were collected on the Island of Nantucket, and for this reason only I have included them among the mollusca of Rhode Island.

FAMILY 27. Trichotropidæ, is represented in New England by one species, trichotropis borealis, which, however, is found only north of Cape Cod.

FAMILY 28. Turritellidæ. Four species of this family inhabit New England, north of Cape Cod.

FAMILY 29. Vermetidæ, Carpenter, represented by one species out of twenty-seven of the genus Vermetus, Adamson, 1757.

32. VERMETUS RADICULA, STIMP.

Syns.:

Vermetus lumbricalis, Gould, non Lam.
" radicula, Stimpson, *Shells of New England*, 37, 1851.

The shell consists of a long, rough, ash-colored tube, marked its entire length with unequal raised lines. The spire consists of eight or ten closely-connected whorls, upon each of which are two sharp, elevated ridges. The shell grows spire downward, unlike any other species we have, and increases in length upward, spiral at apex, and loosely twisted afterward, lengthening out sometimes as much as ten inches. Diameter of tube, one-quarter inch. Seldom is an individual found separate, but in numbers, intertwined together. Aperture round, with a sharp edge, and closed by a horny operculum. Described by Gould, *Invert. Mass.*, 1st edit., as V. lumbricalis, and supposed to be identical with the shell from West Africa described by Gmelin under that name. Stimpson, in 1851, proved it to be a distinct species, and gave it its present name. Found by Mr. S. I. Smith at Gardiner's Bay, at the eastern end of Long Island, and by Professor Adams in New Bedford Harbor, in several groups. One group contained about fifty specimens, living and inseparably intertwined.

(*To be continued.*)

Winter Notes.

MR. H. A. Brush, Milton, Vt., writes us as follows: "A Great Blue Heron was procured by me Dec. 22, on the bank of the Lamoille River. His feet were frozen, and he had lived on fish from a little brook which empties into the river. At the date of his capture the ice was from six to eight inches thick. This is the only specimen that was ever seen in this town as late as this. Last winter I procured two Great Gray Owls."

A Prairie Warbler, just killed, was brought to us Dec. 4th, and a Baltimore Oriole was reported amongst a flock of English Sparrows at Uxbridge, by Mr. A. R. Taft.

CONCHOLOGICAL CHECK-LIST. XIV.

J. RITCHIE, JR.

Sub-order. Ectophthalma Pfr.
Family. Helicinacea Pfr.
Sub-family. Stoastomea Pfr.
Stoastoma agassizianum C. B. Adams.
alderianum Chitty.
anthonianum C. B. Adams.
blandianum C. B. Adams.
chittyanum C. B. Adams.
cumingianum C. B. Adams.
fadyenianum C. B. Adams.
gaskoinianum Chitty.
gouldianum C. B. Adams.
grayanum Chitty.
greyvilleanum Chitty.
hollandianum C. B. Adams.
jadzenianum C. B. Adams.
jayanum C. B. Adams.
layardianum Chitty.
leanum C. B. Adams.
lindsleyanum C. B. Adams.
livesayanum Chitty.
moricandianum C. B. Adams.
moussonianum Chitty.
petitianum C. B. Adams.
pfeifferianum C. B. Adams.
philippianum C. B. Adams.
pikeringianum Chitty.
pisum C. B. Adams.
redfieldianum C. B. Adams.
reeveanum Chitty.
succineum Sowerby.
tappanianum C. B. Adams.
wilkinsoniæ C. B. Adams.

Sub-family. Helicinea Pfr.

Trochatella callosa Poey.
chrysostoma Shutt.
conica Pfr.
constellata Morel.
crassicostata Sow.
elegantula Pfr.
excavata Pfr.
josephinæ C. B. Adams.
luteo-apicata Poey.
methfesseli Pfr.
mouhoti Pfr.
opima Shutt.
petitiana Orb.
petrosa Gundlach.
politula Poey.
Trochatella pulchella Gray.
regina Morel.
rubicunda Gundlach.
rupestris Pfr.
semilirata Pfr.
sloanei Orb.
stellata Velasq.
subunguiculata Poey.
tankervillei Gray.
virginea Lea.
Lucidella aureola Fer.
leana Fer.
lineata Fer.
reana Pfr.
undulata Pfr.
Helicina acuta Pfr.
accuminata Velasq.
acutissima Sow.
adamsiana Pfr.
adspersa Pfr.
agglutinans Sow.
albocincta Hombron.
alboviridis Wright.
altivaga Mouss.
amoena Pfr.
ampliata C. B. Adams.
anaensis Mouss.
andamanica Benson.
angulata Sow.
antillarum Sow.
antoni Pfr.
arakanensis Blanford.
arenicola Morel.
articulata Pfr.
aurantia Gray.
barbadensis Pfr.
bayamensis Poey.
behniana Pfr.
bella Pease.
bellula Gundlach.
beryllina Gould.
beskei Pfr.
biangulata Pfr.
bicolor Pfr.
blandiana Gundlach.
borneensis Martens.
botteriana Pfr.
bracteola Rangel.
braziliensis Gray.
brazieri Pease.

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258 Westminster St., Providence, R. I., U. S. A.

An egg check-list has just appeared, published by Oliver Davie. It will meet a long felt want, not only with beginners, but the more advanced oologist. It is to be regretted that a simpler form was not chosen, that of *comparison* rather than wholly descriptive. For instance, had Mr. Davie described as accurately as possible the egg of the Wood Thrush and then compared the Wilson's and Hermit with it, as being lighter colored, smaller, etc.; then the Robin's as exactly the same color but larger, and that large specimens of the one and small of the other were indistinguishable, we think it would have been better.

The Russet-backed Thrush's egg would be another type to which the Mocking-bird's, Tanager's, and Rose-breasted Grosbeak's could be compared. A comparison of the unknown with the known gives a better impression than the finest description of close shades of color. For the identification of almost anything else Mr. Davie's descriptions would be admirable, but, alas! of what avail are the most careful descriptions of a large portion of our birds' eggs when, with their variety and similarity, they cannot be identified by the practiced expert.

Mr. Davie proposes in the near future to publish another edition, and invites suggestions and corrections. We note a few of the most prominent errors which we gleaned during a hasty perusal. The number of Robin's eggs is *ordinarily* not more than four, instead of five or six. Several of the Warblers should be credited with four or five, instead of three or four. The White-bellied Nuthatch rarely stops at four, but lays from five to nine. Bald Eagles given two to four, but rarely three, two being the usual number. Passenger Pigeons lay but *one* egg, despite the assertions to the contrary, which, however, no one seems able to prove. * Roseate Spoonbill, two or three, usually three or four. American Oyster-catcher given two to four, *very* rarely over three. Limpkin given ten to fifteen. Another author recently stated two or three. Our experience has been considerable with this species, and the number is usually four to seven. Flamingo given two. According to Mr. Maynard this is exceptional, one being the usual clutch. Noddy and Sooty Terns given two to three. We know several who have collected these species, but only one egg to a set.

The Ipswich Sparrow in Rhode Island.

The last week in November found me at Point Judith. After one day's fruitless search for this sparrow in the meadows on the rocky portion of the shore, I repaired on the next day, Nov. 27th, to the sandy beach to the westward, along which is a double row of sand hills extending a distance of about a mile and a half. Upon these hills is a scanty growth of long grass, but not expecting to find anything here I kept along the beach around the hills to the marsh, hoping that I might find the birds I so much desired to get. But finding none, I returned to the beach, pursuing my way back, when a chirp attracted my attention to the sand hills, and a moment later I had an Ipswich Sparrow.

Having now discovered where to find them I took the upper row of hills and my companion the lower, and in this manner probably started all the sparrows on the hills, and secured seven out of eight birds shot at, six being Ipswich sparrows and the other a Savannah. We started three or four others.

When started they would fly from fifty to one hundred yards, usually alighting in the grass in the hollow between the hills.

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* See *Random Notes*, Vol. I., Nos. 3, 4 and 5.

Two of them flew down on the beach, and another was shot from the top of a weed.

After this day's experience I considered them an easy bird to obtain, but the next day's quite undeceived me, for I went out alone and succeeded in starting but three birds, which were very wild, two of which I shot at and saw them fall but could not find them, as they were probably only wounded and took care of themselves.

The third day my wife went with me, as on the first. I started but one bird, and that after walking about half the length of the hills. It would rise about forty yards in advance of us and fly with long undulations, usually until hidden from sight by some intervening sand hill.

After chasing it almost the entire length of the hills we made a circuit, and then began the chase back. There was little danger of its escaping us, as the sand hills were so narrow it would not permit us to pass by.

Several snap shots were made when it arose, and finally it was killed at the end of the hills, after a chase of fully two miles. I am positive that this chase of two miles was for the same identical sparrow.

Song and Tree sparrows were both common along this range of hills, but were distinguishable at a glance.

Bird Migration.

In a letter from Mr. Francis Bain, of North River, Prince Edward Island, he says: "I observe in a report of Dr. Merriam's in Random Notes," that the date of the first appearance of the nighthawk in Prince Edward Island in 1884 is given as June 1st.

Now we observed this species at North River on May 25th; and from records of its arrival, kept for fifteen years past, I find that there has been but a slight variation from that date during this period. On six years the date of its arrival is May 26th, and on the remaining nine years it never varied more than four days from that date.

In comparing my notes with those of other observers, I find that the night hawk reaches this island at much the same time as it is seen at the opposite New Brunswick shore."

Montague Chamberlain,
St. John, N. B.

Editors of Random Notes:

I must range myself on the side of Mr. F. A. Lucas in the matter of making the opening cut from well up on the sternum, especially in the case of skins to be set up with spread wings, and also in the lower order of birds, such as loons, grebes, etc., where the legs are far back. But I would like to ask Mr. Lucas if he does not have trouble with skins of large birds where the wings are tied as he advises in last number of *Ward's Bulletin*. I have tried it in small birds where the humerus is cut away; but on eagles, hawks, owls, etc., I find that if all the wing bones are left in and tied through the double bones, on returning the skin the humerus is sure to push up into the neck. With this exception I like the wing-tying, because it keeps them in place better, both in the skin and the mounted specimen.

Random Notes recently queried as to the first using of a hard body. In *The Useful Companion and Artificer's Assistant*, by H. B. Allen, a chapter on taxidermy is given, culled, evidently, from an English source, in which a body of *wood* is advocated.

We have recently taken a song sparrow, partially albino, the throat, breast, and scapulars pure white. A white cliff-swallow and bobolink have been observed in this vicinity this season.

G. G. Dickey.
Acworth, N. H.

We make the opening incision on the back of all Geese, Ducks, Loons, Grebes and other water-birds which have short, thick feathers on the breast. The advantages are as follows: the breast is left in one unbroken piece; there being no incision there are no grease stains; and if the bird has been kept long, there is not the danger of losing the breast feathers that there would be if the tender portion were along the opening cut.—*Ed.*

A Chewink was seen by Mr. Seamans Dec. 20th, which was by far the coldest day of the month.

Mr. H. L. Clulee, Wallingford, Conn., reports the capture of two Purple Grackle Dec. 31st, and that a Kingfisher is to be seen daily below the mill dam.

On the Blow-Pipe Reactions of Cryolite.

HAVING occasion a short time since to use a very easily melting flux, I thought of cryolite for this purpose, as all authorities on the subject speak of its extreme fusibility.

Before relating my experience with this *fusible* mineral, I wish to quote a few of the many works I have consulted on the subject.

"Very fusible into a white enamel, fusing in a candle flame."—*Booth's Ency.*, 1853.

"Melts below a red heat and forms an opaque glass on cooling."— *Watt's Dict. Chem.*, 1870.

"In the forceps fuses very easily, coloring the flame yellow. On charcoal fuses easily to a clear bead, which on cooling becomes opaque."—*Dana's Text-Book of Min.*, 1883.

"Easily fusible in the flame of a candle." —*Brush's Determinative Mineralogy*, 1878.

It would appear from these quotations and many others of a like tenor, that authors copy each other's statements, without verifying facts by actual experiment.

Now for the facts. I first tried to melt a small piece of cryolite in the flame of a Bunsen burner, which, as everyone knows, is very many times hotter than any candle, lamp, or gas flame; it did not fuse; secondly I threw a small piece into a hot coke fire, used for melting gold in quantity. I stood and watched it for about ten minutes and then removed it with a pair of tongs, in the same condition it went in, excepting that it was whiter in color but not fused even on the edges; then having a large crucible full of melted copper (it takes 2500 degrees of heat to melt copper), I laid some cryolite on the melted metal, shut up the cover and left it there; after some time I opened the fire and the mineral was there just the same. The fact is, that by long continued blowing, cryolite is difficultly fusible on thin edges before the blowpipe. Why should statements of this kind be repeatedly copied into every work published on these subjects? I hope in future editions this mistake will be rectified. Yours truly,

H. F. CARPENTER.

"To the Editors of Random Notes."

To the amateur student, especially if working without a teacher, such an experience as the above is worse than perplexing. It is most unfortunate that so marked an error should appear in standard books of reference.—*Ed.*

Ozocerite, or Mineral Wax.

[BY FRANKLIN S. SMITH, B. S.]

OZOCERITE, from the Greek, "Ozein," smell, and "keros," wax, is a mineral consisting of carbon and hydrogen, and resembles paraffin, or dirty wax. Its color is generally yellowish brown. It is found in Turkistan, east of the Caspian Sea; in the Carpathian Mountains in Austria; in the Apennines in Italy; in Texas and Calafornia, and specimens have recently been found in New Jersey. Commercially, it is worked chiefly in Austria and other portions of Europe, although we have in Utah a larger deposit than in any other place.

Ozocerite from Baku was found by Peterson to have a specific gravity of 0.903, and fused at 70° C. By distillation it gave:

Paraffin	81.8
Gas	13.8
Coke	4.4
	100.0

Ozocerite from Zietriska in Moldau, had a specific gravity of 0.946, fusing point 20.50° C., and distilled at 300° C. It occurs in thin layers of brown to yellowish-brown color. Its structure is leafy, and its fracture resembles mother-of-pearl. It dissolves in turpentine, naphtha, and fatty oils, but little in ether or boiling alcohol, and has a weak odor of coal oil.

"Earth-wax," or ozocerite, has been supposed to be a residuum of oil that has evaporated. It is dug out with picks and shovels, and is about the consistency of clay. The shafts are from 350 to 600 feet deep, and very close together; so close that in a piece of land containing not over fifty acres, there are ten thousand shafts. The walls of these shafts are curbed with timbers, but at the depth to which they go they are so very thin that scarcely a day passes without some of them caving in, breaking the timbers like pipe-stems, and often burying human beings beneath the great masses of earth. The earth taken out of the shafts is carted away a short distance and dumped.

These huge piles of earth which accumulate exert such a pressure near the honey-combed land, that the wax is often forced out of the cracks with such rapidity that the workmen are unable to save themselves. It once happened in a shaft 321 feet deep, that the entire shaft was suddenly filled to the mouth with wax. The veins of wax are from sixteen to nineteen inches thick. These layers render the strata rather uncertain — that is, they slip on each other. Great fires have also occurred in the mines. At Borislau, in Galacia, in 1864, the mines produced 45,000 hundred weight of earth wax.

The paraffin is softer and less transparent than that from brown coal tar, and has a fusing point of 60 deg. C., although sometimes as low as 45 deg. C. All ozocerite oils on purification give a beautiful light-yellow oil of 0.81 specific gravity, of great illuminating power and with a weak, mild odor. The lowest specific gravity of ozocerite is 0.74, while the highest is only 0.828, hence the oil has a low specific gravity and a high boiling-point. Its inflammability is therefore less than that of petroleum. The lightness of ozocerite oil, together with its large paraffin content, contradict the general idea that ozocerite is formed by the evaporation of petroleum. It must have been formed in some other way, of which we are still in doubt, perhaps, as Perutz states, by the oxidation of naphtha.

Ozocerite seems to change slightly by exposure to the air. A piece exposed to the air for a year became ash gray upon the upper surface, while on the bottom it remained a blackish brown. Ozocerite has been found in South Amboy, N. J., in the clay field of Mr. Otto Ernst. In a letter to Professor Smock, of Rutgers College, he says: "I do not think it likely I shall find any paying quantities of it, though I recollect finding a lump ten times as large some years ago. Its low specific gravity probably carried it here by water, from the petroleum fields. An analysis of this specimen gave:

Carbon...........	86.46 per cent.
Hydrogen.........	12.82 "
	99.29 per cent.

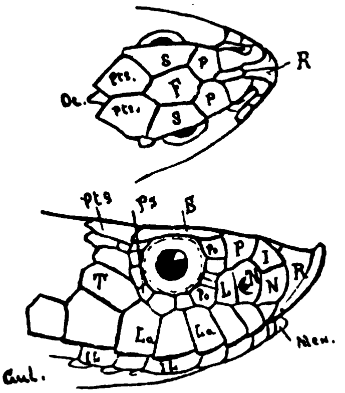
Very little has been made public concerning improvements in making paraffin from ozocerite, and manufacturers keep their experience as secret as possible. In Vienna there are five factories in which are made white wax, wax candles, wax matches, yellow beeswax, and colored tapers. In Europe large quantities of ozocerite are used to wax the floors of the houses.

In the United States the most important uses made of ozocerite are to make chewing gum and to adulterate beeswax.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER VI.



F.	FRONTAL.	Oc.	OCIPITAL.
GUL.	GULARS.	P.	PREFRONTALS.
I.	INTERNASALS.	Po.	PREORBITALS.
IL.	INFRALABIALS.	Ps.	POSTORBITALS.
L.	LOREAL.	PTS.	PARIETALS.
LA.	LABIAL.	R.	ROSTRAL.
MEN.	MENTAL.	S.	SUPRAORBITALS.
N.	NASALS.	T.	TEMPORALS.

THOUGH the snakes of our state are few in number they are, nevertheless, likely to be confounded, the several species, having considerable range of variation, giving the amateur no little trouble in the determination of their identity. Many, during their earlier growth, are quite differently marked from their adult stage, and even the adults of the same species, from different localities, exhibit considerable variation. The only characters which can, to any extent, be relied upon are those presented by the arrangement of the scales, and by the dentition. The plates of the head and scales of the abdominal region are particularly valuable in separating the genera, and to this end will be used in the following *plan*. It should be borne in mind, however, that not unfrequently, adjoining plates may coalesce, and that the larger plates may subdivide.

The first divisions of Rhode Island Ophidia are based on the non-possession or possession of poison glands and fangs. (It is a popular belief that the tongue is the "poison fang." The fangs, properly speaking, possessed only by venomous snakes, are two long curved teeth in the upper jaw so perforated by a canal that the poison, secreted by the salivary glands, situated above the roof of the mouth, has exit near the point of the tooth, making it thus at once a lance and injecting instrument.)

On examining several snakes, some will be found to have the scales along the back provided with a longitudinal rib; such scales are said to be "keeled"; the common Garter Snake has scales of such a character, while the scales of the Black Snake are perfectly smooth. The abdominal plates are the broad scales by the movement of which the serpent is enabled to crawl; the last is often divided. By the use of the following *plan*, the several *genera* which are likely to occur in the state can be determined.

A. Serpents not provided with *poison fangs*.
  Scales of the back prominently *keeled*.
    No scales between *labials* and *orbit*.
      Loreal plate present.
        TROPIDONOTUS.
      Loreal plate absent,
        STORERIA.

    Scales between *labials* and *orbit*.
        HETERODON.

  Scales of the back *smooth*, or nearly so.
    Last *abdominal plate* divided.
      Nasal plates separate.
        Labials seven.
          Preorbitals two, unequal.
            COLUBER.
          Preorbitals two, about equal.
            DIADOPHIS.
        Labials eight.
          Preorbital one.
            ELAPHIS.
      Nasal plates undivided.
          Preorbital one.
            CYCLOPHIS.
    Last *abdominal plate* entire.
      Nasal divided.
          Preorbital one.
            OPHIBOLUS.

B. Serpents provided with *poison fangs*.
      Frontal plate divided.
            CROTALUS.
      Frontal plate entire.
            ANCISTRODON.

Embryology of Fulgur Carica.

AT a recent meeting of the Philadelphia Academy of Natural Sciences, Mr. John Ford reported the finding of capsules of *Fulgur carica*, containing living embryos, near South Atlantic City, on November 16, 1884.

As he had already secured live specimens in December, 1883, and in each of the six months following, this would prove the deposition of capsules by the species mentioned during the largest part of the year, instead of in the spring months only, as was formerly supposed. Living embryos of *F. canaliculata* were also obtained monthly, during the same period.

Several other strings of capsules, including some of *F. canaliculata*, were secured on the same occasion, but exposure to the sun for a day or two had killed the embryos.

At the same locality were discovered two species of living Pholades, *P. crispata* Linn. and *P. truncata* Say, also a fine colony of living *Littorina irrorata* Say; all of these species being new, it is believed, to that part of the coast.

It is probable that the billet of wood in which the Pholades were found had drifted from some distant locality, as there do not appear to be any conditions favorable to their existence between Brigantine Inlet and Great Egg Harbor Bay.

In regard to the habitat of the Littorina there could be no doubt whatever, as they were present in large numbers, and in a flourishing condition, although dwelling literally upon the sand, instead of on broken rock or pieces of timber, where the species is usually found. It is southern in distribution, rarely occurring north of the mouth of Chesapeake Bay.

WHY can't a fisherman be generous? Because his business makes him sell-fish.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XIV.

FAMILY 30. Cæcidæ, Carpenter, with one genus.

GENUS CÆCUM, FLEMING. 1824.

Shell while young discoidal, when adult tubular, cylindrical, arched, decollated. It is born as a flat, spiral shell, but after making two or three turns it suddenly leaves the spire and grows out in a slightly arched curve; soon it drops the spire, plugging up the broken end with a mammillated septure, so that when adult it resembles a tusk, with the small end decollated. They are found in worm-eaten passages of dead shells, and are carrion-feeders.

33. CÆCUM PULCHELLUM, STIMPSON.

Shell clavate, arcuated, contracted at both ends, pale yellowish horn color, and sculptured with about twenty-five strong, rounded ribs, giving the shell a waved appearance; aperture round, entire; operculum multispiral, of eight whorls, corneous, concave on the outer surface. Length one-tenth inch, breadth one-fortieth at its widest part. It inhabits the Laminarian zone, and was dredged in New Bedford Harbor, adhering to groups of Vermeti, and was described by Wm. Stimpson, *Proc. Bost. Soc. Nat. Hist.*, IV., 112, 1851. It probably inhabits Rhode Island waters, but has never been found, to my knowledge, its minute size preventing its being collected.

34. CÆCUM COOPERI, SMITH.

Distribution, Gardiner's Bay, L. I., and Vineyard Sound, Mass., four to ten fathoms. In 1863 Dr. P. P. Carpenter described a shell which he called Cæcum Cooperi. In 1870 Mr. S. I. Smith described and figured a shell which he found in Gardiner's Bay, in the *Ann. Lyc. Nat. Hist.*, N. Y., IX., 394, which he also called Cæcum Cooperi. In the March number of *Silliman's Journal* of 1872, Prof. A. E. Verrill, of Yale College, published a list of the species of mollusca found on the dredging expedition of 1871, at Wood's Holl, Mass., which were new to science, and of those previously described, but omitted or overlooked in Binney's Gould. (*Invert. Mass.*,) published in 1870. Among other shells in this list is a cæcum, dredged in Vineyard Sound. This proved upon examination to be the same as the Cæcum Cooperi of Mr. S. I. Smith, but not the original Cooperi of Carpenter. As the specific name was thus pre-occupied, he proposed the name of Cæcum costatum, Verrill.

The above explanation was read from a paper by the author, on the "Conchology of Rhode Island," before the Providence Franklin Society, Nov. 22, 1872. In the *Report upon the Invertebrate Animals of Vineyard Sound and Adjacent Waters*, published by A. E. Verrill and S. I. Smith in 1874, page 355, Sanderson Smith is credited with having described this shell in *Ann. Lyc. Nat. Hist.*, N. Y., VII., 154, 1860, with the following remarks: "The first description of this species was overlooked by me; as it antedates the description of the Californian species to which Dr. Carpenter gave the same name, the present species must be called Cooperi." I have never seen the original description or the shell.

FAMILY 31. Eulimidæ, contains seventeen genera, many sub-genera, and about four hundred and fifty species, the greater part of which are fossil. The genus Eulima, with forty-nine living and forty fossil species, is represented in New England by one species, the Eulima oleacea, Kurts & Stimpson, *Proc. Bost. Soc. Nat. Hist.*, IV., 115, 1851. It has been dredged in Buzzard's Bay, several miles from land, in soft gray mud, eight fathoms. It has not been found, to my knowledge, in Rhode Island waters.

The genus Stylifer, found only imbedded beneath the skin of star fish and sea urchins, is represented in New England by one species, Stylifer Stimpsonii, Verrill, *Am. Jour. Sci.*, III., 210 and 283, 1872. Off New Jersey, thirty-five fathoms; George's Bank, sixty fathoms; off Block Island, thirteen to twenty-seven fathoms, 1880.

FAMILY 32. Turbonillidae, twelve genera, is represented in New England by five genera, two of which inhabit Rhode Island.

GENUS TURBONILLA, RISSO.

Shell slender, many whorled, elongated, longitudinally ribbed; apex sinistral; aperture simple, ovate; peristone incomplete; columella straight, not plaited; operculum horny, sub-spiral. Seven species inhabit New England, two of which have been found in Rhode Island.

35. Turbonilla interrupta, Totten.

Shell small, slender and pointed, pale brownish white, glossy; surface reticulated by twenty-five to thirty blunt ribs, crossed by fourteen revolving lines, which are interrupted by the ribs; on the lower portion of the body whorl the ribs vanish, but the fine revolving lines remain uninterrupted; whorls eight to ten, a little convex; suture well defined; aperture one sixth the length of the shell, ovate, angular behind; outer lip simple and sharp; inner lip slightly everted. Length, $\frac{1}{4}$ inch; breadth, $\frac{1}{10}$ inch.

This beautiful little species was first discovered by Colonel Totten, in Newport harbor, R. I., and described by him in *Silliman's Journal*, XXVIII., 352, 1835, under the name of Turritella interrupta. It has since been found in various localities from Cape Cod to South Carolina. It is not common anywhere. I have found but six specimens in Rhode Island in over twenty years. It is more abundant in Vineyard Sound and Buzzard's Bay than in any other known locality. Obtained by dredging in three to ten fathoms.

36. Turbonilla elegans, Verrill.

This *new* species was discovered in Vineyard Sound, on a shelly bottom in eight to ten fathoms, by Prof. A. E. Verrill and Mr. S. I. Smith, during the dredging expedition of 1871. Mention is made of the species in the March number of *Silliman's Journal* for 1872, and a quite lengthy description in the April number, page 282. It resembles the preceding species, but is not as slender and the whorls are more rounded. The color of the shell is light yellowish; whorls ten; spire acute. Length $\frac{22}{100}$ inch; breadth $\frac{7}{100}$. I have never seen the species, but it is mentioned in *Cat. Mar. Moll.*, 538, 1882, as having been found in Long Island Sound, off New Haven, and in Narragansett Bay. Of the other New England species referred to above, Turbonilla nivea, Stimpson, inhabits the Maine coast. T. equalis, Say, Vineyard Sound. T. Emertonii, same locality, and Verrill's new species, costulata, areolata, stricta, etc., off New Haven, Conn., and Vineyard Sound. Perhaps some of these may eventually be found in Rhode Island.

Genus Odostomia, Fleming.

The genus Odostomia differs from Turbonilla principally by having smooth shells, instead of being ribbed, a less number of whorls, and in having a tooth or fold upon the columella. The species are numerous, distribution universal, from *high* water mark to forty fathoms. I emphasize this word *high*, as authorities say *low* water, etc., and will explain my reason for saying this in the next chapter.

Four species of Odostomia have been found, and seven are liable to be collected in Rhode Island, descriptions of which will be given.

(To be continued.)

The Color of Birds' Eyes.

I have been much interested in your notes on the color of birds' eyes. You give that of the California woodpecker as white; a friend in California who sent me mine, wrote that the eye was pink.

Two specimens of the pileolated woodpecker had red eyes, and I once mounted a fine ♂ sheldrake, who had eyes nearly black; also, a ♀ long-tailed duck, whose eyes were certainly white. I once saw an avocet in full plumage with eyes nearly black, though I believe they are usually red. I observe that some taxidermists use brown and others blue eyes in the English jay. What is right? I should suppose brown, judging by the rest of the family, though the Guiards jay does have blue. E. J. Smith.

We have invited observers to report to us upon this important subject, and shall be glad to publish any new notes.—*Ed.*

Early in November a Snowy Owl was captured at Newport. This is the only one reported to us.

The winter thus far has been characterized by few winter visitors from the North. Several parties in Maine, New Hampshire, Vermont, and New Brunswick report taking Hawk Owls, from five to a dozen individuals each.

CONCHOLOGICAL CHECK-LIST. XV.

J. RITCHIE, JR.

Family. Helicinacea Pfr.
Sub-family. Helicinea Pfr.
Helicina brevilabris Pfr.
briarea Poey.
bryanti Pfr.
callida Weinl.
campanula Pfr.
candida Pfr.
caracolla Moric.
carinata Orb.
catalinensis Pfr.
chiapensis Pfr.
chrysochasma Poey.
chrysocheila Shutt.
ciliata Pfr.
cinctella Shutt.
cingulata Gass.
citrina Grateloup.
colorata Pease.
columbiana Phil.
columellaris Gundlach.
concentrica Pfr.
concinna Gundlach.
constricta Pfr.
contermina Semper.
convexa Pfr.
cordilleræ Sallé.
cornea Sow.
coronula Shutt.
costata Gray.
crassilabris Phil.
crocea Benson.
crossei Semper.
culminans Mouss.
cumingi Sow.
decolorata Mouss.
delicatula Shutt.
depressa Gray.
diaphana Pfr.
discoidea Pease.
diversicolor Cox.
draytonensis Pfr.
dunkeri Zeleb.
dysoni Pfr.
egregia Pfr.
elongata Orb.
exigua Pfr.
Helicina exserta Gundlach.
faba Pease.
fasciata Lam.
festiva Sow.
fischeriana Montrz.
flammea Quoy.
flavescens Pease.
flavida Menke.
foveata Pfr.
fragilis Morel.
fulgora Gould.
fulva Orb.
fuscata Gundlach.
gallina Gass.
gambieni Paz.
ghiesbreghti Pfr.
glabra Gould.
globosa Gray.
globulosa Orb.
gonochila Pfr.
gouldiana Forb.
granum Pfr.
guadaloupensis Sow.
guttula Pfr.
hæmistoma Moric.
hanleyana Pfr.
heatei Pfr.
heloisæ Sallé.
hemisphærica Shutt.
hainanensis Mölldf.
hernandezi Wright.
herweghiana Pfr.
hialmarsoni Pfr.
inconspicua Pfr.
interna Mouss.
jamaicensis Sow.
japonica A. Adams.
jucunda Gundlach.
jugulata Poey.
kieneri Pfr.
küsteriana Pfr.
laciniosa Mighels.
lazarus Sowerby.
lens Lea.
lifonana Cross.
lindeni Pfr.
lineata C. B. Adams.

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The statements in an article on cryolite in a previous issue and our editorial having been called in question, we have made various experiments desiring to correct any false impressions. We found that before the blow-pipe on charcoal, cryolite in small quantities fused to a liquid; in the pincers, with a well-directed R. F., it reduced and changed form; in gas-flame we were able to turn ends and thin edges to a white enamel, and in candle flame, by carefully introducing a fragment into the hottest part a limited fusion was produced.

It does not, like stibnite (noted as No. 1), melt and drop. The term "easily fusible" seems to admit of much greater latitude of meaning than we had imagined.

A Collecting Trip to Cape Cod.

Chatham is the southeastern point of Cape Cod. To the eastward, at a distance of one-half to three-quarters of a mile, is the sand-bar, and between are the flats over which a sail-boat can float at high water, while at low tide so much is bare that there is not enough water in the channels to get a row-boat across.

We reached Chatham about noon of May 21, 1883, and lost no time in putting on our hunting-clothes, as the tide was ebbing, and we wished to spend the afternoon on the bar. As we were being pulled across a fog was beginning to settle, which was soon very thick, and three birds, one apiece, were all we obtained.

Our row back to town was an eventful one, which we shall not soon forget, for, mistaking the roar of the ocean at the inlet for the rush of the incoming tide across the flats, we came very near being swamped, and not till our boat was partly filled with water from the rolling billows, did we pull into still water, to await the clearing up of the fog, or morning, we knew not which. Being strangers, we left the rowing to our boatman, a boy of sixteen, who thought he knew where he was going, and did not want to admit that he did not. Suffice to say, when we pulled away from the threatening danger, we found a sail-boat moored, which, being recognized by the boatman, our correct course was laid, and we were soon doing justice to our host's well-spread table.

The day following was also foggy, and poor was our success, a few Wilson's Terns, Piping Plover, and Turnstones being all, until, approaching a small sand bar on our return, a group of birds loomed up looking much larger than reality, but a shot laid out one Black-bellied Plover and one Red-breasted Sandpiper, both fine specimens.

Before daylight of Wednesday, the 23d, we were on our way to the bar. The two preceding days, besides being foggy, had been windy and considerable rain had fallen, but with our gossamer coats and hip boots we were well protected. The present day was, however, free from fog, and for the first time we could look about us.

Most plentiful of all were the Terns which were to be seen flying in every direction, while on certain sand-bars they were resting in large numbers. When a school of small fish is discovered the Tern pauses in its flight, and hovering over them, turns its head with bill directly downward, and an instant later descends the same as a Kingfisher. Others follow, and soon the whole flock are diving, rising to the proper height, and diving again. Occasionally a Tern approached within gunshot, and if shot others would pitch over it, and several could be secured. We had in this way cut down several Arctic Terns and a few Bonaparte's Gulls, two or three wounded of which were drifting away from us, and I had run to where our boat was beached in order to row out and secure them.

We came across in the early morning on the ebb tide, and now, several hours later, the tide was coming in and at the present time was running swiftly. Just before I reached the boat my attention was attracted to a few small birds about three hundred yards away. Their motions were exceedingly graceful, and they appeared as light as bubbles on the water. They seemed to be at play, constantly springing from the water and flying first one way and then another, as if playing tag or puss in the corner. The instant I caught sight of them I involuntarily said "Phalaropes."

(*To be continued.*)

Notes on the White-breasted Nuthatch.

(Sitta Corolinensis.)

Following the idea of John Burroughs, I procured some beef bones and nailed them on a large willow tree in such a position that I could readily see them from my study window; with the intention of attracting and noticing a few habits of our friend, the Downy Woodpecker.

Rather to my gratification I found that one of my little friends, a White-breasted Nuthatch, appreciated my kindness more than the Downys. The bones appeared to remain for several days entirely unnoticed, and I had almost given up hope, but on one snowy Sunday morning I happened to see my little friend busy at the bones; he would tug hard at a piece of fat until he pulled it off, if it happened to be a small one he would eat it, and if any rather longer piece was secured he would adjourn to a crack in the bark not far off and very neatly hide it in the crevice, and in a few cases would fly to an adjoining tree, and do the same with other pieces taken from the bones. By watching through an opera-glass I could see the end of the meat thus hidden protruding from the crack. What his idea was in so doing I cannot say, unless he acted on the principle of the dog who buries his bones, "to lay by for a rainy day."

One day when watching him work he stopped to take a look around, and caught me standing at the window, when he took his immediate departure, as if he thought he was intruding on private property and was under danger of immediate arrest by myself. Loath to return so long as I was at the window, he kept flying from tree to tree, looking to see if I was about, and not till I left my place did he venture back.

Another rather interesting little instance happened about these bones. One morning while my little friend was busily partaking of his meal of beef, there came upon the scene a female Downy Woodpecker (the males have the red crown, this bird not having any). The Nuthatch immediately on the fresh arrival turned away from his feast, and quietly went around the trunk of the tree in search of other food. Whilst Miss Downy was helping herself there came upon the scene with a great chirruping several English Sparrows, who arranged themselves along a small branch directly over the bones, and in silence eyed the above mentioned lady. No sooner had Miss Downy left, than the sparrows came down in a body on a large knot just below the bones, but they could not get within reach of the prize, for, unlike the Nuthatch and Woodpecker, they had not the power of running up the side of a tree. It was very amusing to witness the apparent disappointment of the sparrows on finding themselves so badly baffled in their designs.

John H. Steele.

April Insects.— The first flowers of spring teem with insects of many orders, but especially the Hymenoptera of the genera Andrena, Halictus, Melissodes, and Nomada, which have issued from their underground nests. The honey-bee (Apis mellifica), the carpenter-bee (Xylocopa virginica), and the bumble-bee (Bombus) are conspicuous. Among Coleoptera, the blister-beetles (Meloidæ) and the tiger-beetles (Cicindelidæ) are noticeable; and the painted clytus (Cyllene pictus), with its black-and-yellow banded coat, will be common in houses where hickory-wood is used in the fires. Among Lepidoptera, the blues (Lycænidæ), the monarch or milk-weed butterfly (Danais archippus), the Graptas and Eudamus bathyllus will be seen. Among Orthoptera, the Acridium americanum and Œdipoda phœnicoptera will be noticeable among wintering forms on account of their large size. — *Science Almanac.*

Insect Collecting.

F. E. GRAY.

THIS is a subject about which much has been written, and there are many different ideas about the methods used, so that something new may be gained from each writer. I have been asked many times, what poison I used, and how I made my lure for night collecting. My experience may develop some points that will be of advantage to others.

The first thing to be thought of is the poison to be used to kill the specimens. Some have a preference for ether, others for cyanide of potassium. I find that the best chloroform is by all odds the safest, cheapest in the end, and produces better results than any other poison. Ether requires a longer time to kill than chloroform, while cyanide will not answer with many of our delicate-colored insects unless they are removed from the collecting bottle very shortly after being caught, for if left in a minute too long, the powerful poison will act on the delicate coloring matter and either completely destroy it or render it several shades lighter, thus spoiling the insect as a specimen. And what collector would wish to stop, should he be on the jump for an hour at a time, in a locality where insects are plenty, and no time to pause without the risk of losing some rare specimens, for it takes but a few minutes to spoil a specimen, so quickly does the cyanide eat into the tissues of the body and wings. It answers very well on our larger coleoptera, as they are very hard to kill, but even then, care has to be taken, for it is dangerous to handle, or even to breathe the fumes, as it is, with one exception, our deadliest poison. I have used chloroform for several years, and it has given me the best of satisfaction, with no danger in the handling. Cyanide stiffens the muscles of insects so that it is very difficult to set up a specimen after being killed, even if it is softened by exposure to steam; while chloroform merely stiffens them for a few moments, they quickly relax, and can be set up with ease several hours after being killed. I have had some of our most delicately colored moths soaked with chloroform in a collecting bottle for nearly half a day, and within two minutes after their removal the chloroform would evaporate, and the colors come out as bright and clear as in life, and even after remaining in my cabinet for years, show no change in color, and for this reason I am inclined to think that it tends to fix the coloring matter, instead of hurting it.

Experience has taught me that few boxes and bottles are necessary, unless for an extended trip of several days. For a hunt around the suburbs of the city, I provide myself with a folding net, with a handle about four and a half feet long, for lepidoptera, a large-mouthed bottle holding a half-pint or so, and a smaller one for coleoptera, for in dying, the hard bodies and sharp tarsi of the beetles are apt to injure the wings of moths and butterflies, when put in the same bottle. Then, with a half dozen small boxes of different sizes lined with cotton, and a "digger" (a broad-bladed old chisel) for working around stumps and trees, I am fully equipped. The chloroform I carry in a small vial in a vest pocket. In preparing my collecting bottle, I cut three thicknesses out of cotton batting to fit inside the bottle, and glue lightly around the edges to prevent slipping, and when on the ground I pour ten or more drops of the chloroform on the cotton, renewing it in about an hour. When I have a number of insects in either bottle, I remove them to the boxes, and add to the same until they are full, for I find there is less danger of damaging specimens when closely packed than when only two or three are placed in each box. Paper cut for the purpose is a good thing to carry for large, fine specimens.

For a lure for night collecting, I have found that the best is made with a pint of ale or beer, either fresh or stale, with about a pound and a half of dark brown sugar thoroughly dissolved in it. Many collectors put the lure on the trees in the daytime and then collect from them in the evening; but I have found that when this is done the ants, those pests of insect society, will generally cover the lure before I am ready for work at night, and in such numbers that it is impossible for a moth to alight. About sunset I lure eighteen or twenty trees, putting one or two brushfuls of the lure on each, and then, after waiting fifteen minutes or so, find that it works to a charm. For a lantern I use a large size "bull's eye." The best nights for collecting with the lure are those in spring when the weather is what we call "muggy." In the spring of 1883, when collecting from a lure, I captured 120 moths, besides a number of beetles, from a clump of eleven trees. The moths caught in spring are mostly the Noctuids and Geometrids. Night collecting with lure can be commenced about March 1st, and continued until the flowers bloom; then taken up about the middle of August, when our beautiful catocala moths can be taken in considerable numbers, besides many of our rarer Geometrids. I find that it is almost useless to lure the walnut or hickory tree, as very few insects will be taken from them, for what reason I cannot explain. If there is any tree where the sap is running freely in the spring, either from an abrasion of the bark or a cut from an axe, don't neglect visiting it day and night, as many insects will be caught thus which would not visit a lure.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER VII.

HAVING, by aid of the plan given in the previous number, determined the *genus*, the reduction to *species*, when we have several species under a single genus, as is the case with Tropidenotus, is, for Rhode Islanders, a comparatively simple operation. It will be noticed, however, that the several descriptions do not follow the artificial order of the plan, but are arranged in their natural order, the highest form being treated first.

1. *Crotalus horridus* LINNÉ. The Banded Rattlesnake was described by Linné, in 1758, as the most venomous of the serpent tribe, growing to a length of six feet, and as thick as a man's arm. Through the observations of later naturalists, however, the "rattler" seems to be a reptile venomous only to a slight degree, when compared with such forms as the deadly cobra of India. Though the sting of *Crotalus* may be extremely painful, it should never prove fatal if properly attended to. Sucking or cauterizing the wound, and drinking large quantities of spirits, are said to generally check the serious effects of any ordinary attack. In our state the rattlesnake is occasionally met with among the northern hills. On being surprised it is lazy, and, instead of at once taking the offensive, ordinarily gives its alarm, provided it is old enough to possess a rattle, and then, if further pressed, may strike. Even if this happens the venom is not necessarily forced from the fangs, the snake seeming to realize that its supply of poison is not unlimited and if once exhausted it will be compelled to remain harmless until the glands have secreted enough to again fill the reservoirs. This is not the only form which makes its presence known by an alarm. Many of our "adders" when in dry leaves, by rapidly vibrating the tail, produce a sound so nearly resembling that of the "rattler," as to even deceive an expert. The rattle, a most common cabinet curiosity, is made up of a series of horny rings, each consisting of a posterior tongue-shaped portion, which is held in the hollow, cup-like, anterior portion of its succeeding fellow by a terminal knob, the so-called "button." It will thus be seen, that if a portion of the rattle is broken off, a "button" will always remain. As such an accident is not unfrequent, and since several new rings may be added during a season, the number of rings can in no way indicate the age of their possessor. It might further be added that many common snakes are provided with an horny appendage at the termination of the tail. This should not be mistaken for a rudimentary rattle by the amateur; the young as well as the old rattlesnakes are armed with poison fangs which at once distinguish them. In general form, *Crotalus* is short and stout, seldom four feet long.

2. *Ancistroden contortrix* BAIRD AND GIRARD. (Trignocephalus contortrix Linné.) The copperhead, viper, or deaf adder, has been placed among the Rhode Island snakes because of the numerous instances of its capture in neighboring localities. I can find no native specimen in such local collections as I have examined, nor any instance of its capture. This with the previous species are the only poisonous varieties likely to be found in our limited area, or in fact anywhere in eastern United States. Any facts in regard to either form would be particularly valuable.

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. I.

It is the purpose of the writer to prepare for Random Notes a series of brief articles upon the trees indigenous to Rhode Island. Avoiding, as far as consistent with accuracy, mere technical terms and descriptions, it is intended to record such facts concerning our native species of trees as will afford an intelligible and fairly complete view of them at the time of writing. Whatever is peculiar to their growth or appearance, in this locality, will, so far as known, be stated. The local effects of climate and exposure, and of the different soils, upon the growth and production of the different species will receive attention. The economic value of the different kinds will be noted. And, finally, the relationship which our trees sustain to us as beautifiers of our homes and landscapes will receive occasional mention.

The necessity for brevity in the sketches to be given compels the omission of much that might be of interest, especially to the general reader; but it is hoped that what may be offered will, in some degree, promote the objects for which this periodical is published.

Generally speaking, the country comprised within the limits of New England is a natural forest region. The denudation which has taken place within Rhode Island has been gradually effected, as the settlement of the region demanded the land for agriculture, and the forest growth for timber and fuel. The islands of the state, once heavily wooded, have long since been laid bare; and a considerable part of the land bordering upon the Narragansett Bay and in the immediate vicinity of the larger towns, has shared the same fate. Sterility has frequently followed the destruction of the forest upon large areas; but where the denuded tracts have been neglected by the plow and have been protected from browsing by cattle, the natural tendency of the soil shows itself in a new growth of trees.

But there are still considerable tracts of the hard, stony lands, in the remoter parts of the state, almost exclusively devoted to the growth of wood; and, in nearly all parts of the state there are copses and rows of trees preserved for their protection or as "wind breaks," and great numbers of small groups and of single specimens are allowed to stand for their shade and landscape beauty.

The state is believed to be notably rich in the variety of its natural ligneous growth. About fifty species of native trees (growing to thirty or more feet in height) are found here. Taking lead among these, in number of species, in economic value and scenic attractiveness, are those of which we first treat,— the

CUPULIFERÆ, OAK FAMILY.

Quercus, Oak.

Quercus alba, *White Oak*.

The oaks, here and elsewhere, are naturally divided into two sections:

1. Those which mature their acorns during the autumn of the first year. 2. Those which do not mature their acorns until the autumn of the second year. *Annual-fruited* Oaks, and *biennial-fruited* Oaks. Of the former the White Oak, *Q. alba*, may be regarded as the type. In Rhode Island it is a stately tree, found in numerous localities, in all parts of the state. It is found in company with other species of the oak, with the hickories, and various other trees, and is frequently mingled with a straggling growth of pitch pines and white birches. In certain localities it occupies the ground almost to the exclusion of other trees. Many years ago, when there was an active demand for ship-timber, for water-wheel shafts, etc., the hillsides and valleys of the state were culled for the best timber of this oak. This work made serious inroads upon the tree. A few specimens, too sturdy and rugged for the axe, escaped. To-day they are among the noblest trees of the state. The following specimens may be mentioned as especially noteworthy: A large symmetrical tree, upon Mr. Chas. E. Hall's farm, Fruit Hill, North Providence; height, 65 ft.; spread, 87 ft.; girth, 4 ft. up, 15 ft. 2 in. A large, finely proportioned tree, one mile below Hamilton Mills, North Kingstown; girth, 3 ft. up, 13 ft. 4½ in. The body is short, but it has a magnificent spread of top. The "Catholic" oak, in Lonsdale, is worthy of special note. The tree now has a spread of 86 ft. It was probably much greater before its original branches were

cut off. Its height is 70 ft., and its girth, 5 ft. up, is 15½ ft. Dr. C. W. Parsons has taken several measurements of this tree, the first being in January 1858, when its girth, 4 ft. up, was 13 ft. 4 in. It is said that, through the agency of the Rev. J. C. Richmond, acorns of this tree have been distributed through many towns of Germany, where its progeny are now growing. The religious services, which in former years were often held under this tree, have clothed it with a sacredness which reminds us of the venerated oaks of Europe in the days of the Druids.

The characteristics of this tree in Rhode Island, as it appears in well developed specimens, grown upon open ground, may be summed up as follows: Size, 1st class; short body, wide-spreading top, generally symmetrical, limbs stout, often much contorted, the branchlets short and stiff, striking out at wide angles; buds, small; leaves without bristles (the same is true of all the species in the White Oak division), presenting beautiful models of curving; acorns small, in a deep cup, sweet and edible; bark white, in loose scales. The tree is of slow growth, and may be called young at the age of a century.

Such has been the destruction of this tree that it is doubtful if there are a hundred well-grown, fully-developed specimens in the state.

Of all our northern oaks this is the most valuable for timber, ranking next to the southern "Live oak," and it is excellent for fuel. The distribution of this species is very extensive, it being found in nearly all sections of the United States, and as far north as Lake Winnipeg. It finds a congenial home in Rhode Island.

MR. E. J. SMITH writes: "I have lately tried an experiment in cleaning shells. I boiled some cones and a few others for three or four minutes in a strong solution of potash, and the epidermis came to pieces and fell off, leaving the shell clean and smooth, with no evil effect at all. Three or four ounces of Babbitt's potash to a pint of water is about the proper strength. (The mixture may be saved and used many times.) Scrub the shell with a stiff brush, and when it is dry rub with a cloth very slightly oiled, to obtain a fine gloss."

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XV.

37. ODOSTOMIA BISUTURALIS, SAY.

Syns.:

Jaminia exigna, Couth. Kuster.
Odostomia exigna, Gould. Stimp.
Rissoa rupestris, Forbes.
Chemnitzia bisuturalis, Stimp.
Turritella bisuturalis. Say.
Odostomia bisuturalis. Modern authors.

"Shell thin, pellucid, small, conic; whorls five, wrinkles almost obsolete, a revolving impressed line near the suture; suture not deeply impressed; spire gradually tapering, rather longer than the aperture; aperture rounded at base and perfectly entire. Length rather more than one-tenth inch. Inhabits Boston Harbor."

The above is Say's description. *Journ. Ac. Nat. Sci.*, Phila., II., 244, 1821.

Gould's *Invert. Mass.*, p. 328, 1870, says: "First found by Mr. Couthouy at Chelsea, near the ferry landing, adhering to decaying wood." Couthouy described it in the *Journ. Bost. Soc. Nat. Hist.*, II., 92, 1838, under the name of Jaminia exigna. How can this be? If Couthouy discovered it first, its name should be Odostomia exigna, as it belongs to this genus and not to jaminia or turritella, but Say described it in 1821 as above, although not accurately in all points, yet enough so to give his name priority. The revolving line just below the suture, making the suture to appear double, gives it its specific name, which is most appropriate. The shell is one-fifth inch in length and one-tenth in breadth. It is white or light greenish in color, under a brownish epidermis, its apex is obtuse, and at the base is a small umbilicus, near which, on the inner lip, is a transverse white tooth or fold. It is one of the most common species in our bay, but from its minute size is liable to be overlooked. It is found on oysters and other living and dead species from the bottom of the bay, but is more plentiful on stones and dead shells between tides, and is found abundantly in the shell sand thrown up on the shore by storms. I have taken nearly a hundred living specimens off a stone no larger than my hand lying nearly at *high-water mark*. It inhabits Massachusetts Bay to Long Island Sound.

38. ODOSTOMIA TRIFIDA, TOTTEN.

This species was discovered on the Island of Rhode Island by Colonel Totten, on valves of scallop shells (Pecten irradians, Lam.), and described by him in *Am. Journ. Sci.*, XXVI., 368, 1834, under the name of Actæon trifida. It inhabits the same localities as the preceding species, and is as abundant in Rhode Island, if not more so. It closely resembles bisuturalis, but is a little more slender in appearance, being one-fourth inch long by one-tenth wide. Its apex is acute, color glossy white, whorls eight in number, flat, separated by a sharp depressed suture, with three revolving lines below the suture and numerous fine lines on the front of the body whorl; the outer lip showing on the sharp edge the impressed lines; otherwise it resembles in all respects the above bisuturalis.

39. ODOSTÓMIA PRODUCTA, ADAMS.

Syns.:

Jaminia producta, Adams.
Chemnitzia producta, Stimp.

This species also inhabits the same localities as the two preceding, but is not at all common in Rhode Island. It is light brown in color, with eight whorls, nearly flat. It is more slender than either of the others, being a little over one-fourth inch in length by one-fifteenth in breadth; the apex is blunt, as if one or more whorls were removed; the surface is faintly marked by lines of growth; aperture about one-fourth the length of the shell, ovate, rounded in front, columella flexuous. It also differs from the others in having no umbilicus. It was discovered by Professor Adams, near Fairhaven, in 1839, and described in *Bost. Journ. Nat. Hist.*, III., 322, 1840.

40. ODOSTOMIA FUSCA, ADAMS.

Syns.:

Pyramis fusca, Adams.
Jaminia fusca, Adams.
Chemnitzia fusca, Stimp.

This species was discovered by Prof. C. B. Adams, at New Bedford, clinging to planks near low-water mark, and described in *Bost. Journ. Nat. Hist.*, II., 282, 1839. It resembles the preceding, but differs in several points. The apex is more obtuse than in bisuturalis, it has one to three more whorls, with a smooth surface and no revolving line under the suture; the aperture is broader and modified by a twist of the columella; the color is violet brown, glossy, darker at the tip. It is quoted from Vineyard Sound to New Jersey. Quite rare in Rhode Island. Length one-fourth inch, breadth three-fortieths.

41. ODOSTOMIA DEALBATA, STIMPSON.

"Shell ovate-conic, white, smooth, pellucid; whorls six, rather convex; aperture ovate, hardly effuse; furnished with a small inconspicuous fold. Length $\frac{17}{100}$ inch, breadth $\frac{6\frac{1}{2}}{100}$. Dredged in Boston Harbor, three fathoms, on a shelly bottom." (Stimpson.)

New Haven, Conn. (Perkins). "I have never seen this species."

42. ODOSTOMIA SEMINUDA, ADAMS.

Syns.:

Jaminia seminuda, Adams.
Chemnitzia seminuda, Stimp.
Turbonilla seminuda, H. & A. Adams.

Shell acute-conic, white and glossy, translucent; whorls six or seven, the upper ones and one-half the body whorl covered with numerous ribs or folds crossed by three revolving equidistant lines, making the surface to appear covered with net work, while the lower half of the body whorl has four revolving lines, not reticulated; outer lip thin, scalloped by the lines. Length $\frac{15}{100}$ inch, breadth $\frac{7}{100}$.

This species was discovered by Prof. C. B. Adams, at Dartmouth, adhering to the valves of scallop shells, and described in *Bost. Journ. Nat. Hist.*, II., 280, 1839.

Inhabits from Massachusetts Bay to South Carolina. Common in Vineyard Sound and Buzzards Bay, in 2 to 10 fathoms. (Verrill.) Greenport and Huntington, L. I. (S. Smith.) Fort Macon, N. C. (Coues.) Not very common in Rhode Island.

The only other species which might possibly inhabit our shores is the Odostomia impressa, Say, *Journ. Ac. Sci.*, II., 244, 1822, being quoted from Long Island Sound to South Carolina. Say saw but two specimens, which he collected on the coast of Maryland.

(To be continued.)

CONCHOLOGICAL CHECK-LIST. XVI.

J. RITCHIE, JR.

Family. Helicinacea Pfr.
Sub-family. Helicinea Pfr.
Helicina lirata Pfr.
littoralis Montrz.
littoricola Gundlach.
lundi Beck.
lutea Lesson.
macgillivrayi.
macmurrayi Pfr.
maculata Sow.
malleata Pfr.
margaritacea Lea.
marginata Gundlach.
martensi Issel.
maugeriæ Gray.
maxima Sow.
mediana Gass.
microdina Morel.
miltochila Cross.
miniata Less.
minuta Sow.
moquiniana Recluz.
moreletiana Pfr.
multicolor Gould.
musiva Gould.
nemoralis Gupp.
neritella Lam.
nicobaria Phil.
nitida Pfr.
nobilis C. B. Adams.
nodæ Arango.
notata Sallé.
nuda Arango.
occidentalis Gould.
occulta Say.
oceanica Pease.
oleosa Pfr.
orbiculata Say.
orbignyi Pfr.
oweniana Pfr.
oxytropis Gray.
pallida Gould.
paraensis Pfr.
parva Sow.
parvala Pease.
pellucida Sow.
pfeifferiana Arango.
phasianella Sow.
Helicina pisum Phil.
platychila Mhlf.
plicatilis Mouss.
plicatula Pfr.
poeyi Pfr.
politula Poey.
porphyrostoma Cross.
primeana Gass.
psorica Morel.
pulcherrima Lea.
pygmæa Pot. et Mich.
pyramidalis Sow.
raresulcata Pfr.
reeveana Pfr.
reticulata Pfr.
rhodostoma Gray.
rhynchostoma Shutt.
rohri Pfr.
rostrata Morel.
rotella Sow.
rotunda Orb.
rubella Wright.
rubicunda Pease.
rubromarginata Gundlach.
rufescens Pease.
rugosa Pfr.
rustica Pfr.
sagraiana Orb.
salleana Pfr.
salvini Tristr.
sanguinacea Pfr.
scropulorum Morel.
scrupulum Benson.
semperi Mouss.
shanghaiensis Pfr.
silacea Morel.
similis Sow.
sinuosa Pfr.
solida Pease.
solidula Gray.
sophia Brazer.
sordida King.
sowerbyana Pfr.
spectabilis Gundlach.
sphæroidea Pfr.
straminea Morel.
straminea Pease.
strebelli Pease.

Random Notes on Natural History.

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A Collecting Trip to Cape Cod.

(Continued.)

As soon as the boat was in the water I was making for those birds for all I was worth, and in a few moments a pair of Northern Phalaopes lay upon the water about forty yards apart. While picking them up, the boat drifted by the swiftly incoming tide, was several hundred yards from where it started, and after beaching it at the nearest point I hastened to my companion, whom I dispatched for the two lads who rowed for us, while I put cotton in the mouths of the birds we had taken and did each up in a paper. The boys were loth to leave their decoys to hunt the new birds, even when we offered them five cents each for every bird that was killed, no matter who killed it. The boys did not pull very energetically until a flock of thirty or forty were sighted, when they partook of some of our enthusiasm. This flock was moving against the tide with the same playful motions, those in the rear flying over and dropping in the water in front of the others, and in this way about one quarter of them were in motion all the time.

Our lads succeeded in pulling alongside at a distance not to scare them, and, getting ahead, we paused broadside directly in their course. On they came, entirely unconscious of danger, and our fire killed and wounded seven or eight. We drifted nearly half a mile northward while picking them up, and then began the hunt for them again. This time we sighted them nearly half a mile south of where they were previously, but, though the lads pulled hard, they were unable to get in front of them again, or even within gunshot from the side. Over and over one another they went, keeping the same distance ahead and to one side, until, reaching the narrows, they wheeled, and flew away to the north, farther than we could keep our eyes upon them.

We put about and met them coming, as before, and secured a couple, after a hard pull. Repeating this a few times more, with poor success, we found the flock had separated into smaller ones and pairs, and we had little trouble in securing them. They were now resting or swimming, and not constantly leaving the water. One bunch of nine was all cleaned up with our four barrels. In less than three hours' time the boys earned $1.85 each, and had a very good opinion of Phalarope hunting.

The next day, at flood tide, we found another flock of considerable size on the flats and succeeded in getting sixteen more. This flock was about the inlet, and we followed them as far to the ocean as it was safe for a dory to go. We now saw where we had been on the Monday night previous, actually into the edge of the breakers.

The female Northern Phalarope is much handsomer than the male, and though not able to equal the Wilson's in beauty, yet in spring dress it is one of the very handsomest of our shore birds. These Phalaropes are known to fishermen as "whale birds," and are usually to be met with off shore, and probably not within several miles of the land.*

After the Phalaropes had gone upon the ocean we set out our decoys and secured a fine lot of Red-breasted Sandpipers, Turnstones, and Sanderlings. We saw flocks of Black-bellied Plover, but could not decoy them, as they are very shy and difficult to obtain in the spring, and if one individual is among a flock of other birds, it leads and usually keeps them out of danger.

Arctic and Wilson's Terns were abundant, but each seemed to keep in flocks by themselves. But one Roseate Tern was obtained. A few pairs of Least Terns breed on the sand bar. They seemed to be mating, for they were flying in pairs at a height of 100 yards from the ground, one chasing the other almost constantly. One Greater Yellow-leg and a single pair of Red-breasted Snipe were observed. A flock of about thirty Bonaparte's Gulls, all in the young plumage, would fly about and very near us, seeming less shy than any of the Terns. We obtained from a boy one set of Piping Plover's eggs just before our departure on the 29th, and when we left nearly all the migrants had passed, except Sanderlings.

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* Mr. Dutcher, in the January, '84, *Auk*, writes of the abundance of this bird at Long Island during the same two days that I met them.

May Insects.

In this month the hibernated legion is warmed to new life, and the number of species occurring is too great to warrant special indication. The large tiger swallow-tail (Papilio turnus) darts swiftly about, while a lot of humbler butterflies are seen. Those gigantic beauties of the night, the Cecropia moth (Platysamia cecropia) and the Polyphemus moth (Telea polyphemus), are seen hanging listless as they just issue from their cocoons, or pass bat-like at dusk overhead.

Some of the hawk-moths (Sphingidae) already begin to hover at twilight over honey-yielding flowers. The carpenter moth (Xyleutes robiniae) will be found early in the morning, resting on the trunk of the black locust, from which the empty pupal exuvium sticks out as an index. A host of Hymenoptera make their advent; and noticeably the gigantic saw-fly (Cimbex americana) will be found ovipositing in willow leaves, and the pigeon Tremex (Tremex columba) in old maple trunks. The buffalo-gnat (Simulium) swarms in the lower Mississippi country. The fruit-grower finds the plum curculio (Conotrachelus nenuphar) making its dreaded crescent-mark on his fruit, and the canker-worms blighting his apple-trees. The housekeeper observes with dread the various clothes-moths (Tinea) and the carpet-beetle (Anthrenus scrophulariae). But the latter part of the month is chiefly characterized, first, by hosts of delicate May-flies (Ephemeridae); second, by the swarms of May-beetles (Lachnosterna fusca), which begin to defoliate oak-groves and poplar trees.—*Science Almanac.*

In reply to a letter concerning the breeding habits of White-bellied and Violet-green Swallows, Mr. R. P. Chandler writes: "The White-bellied Swallow nests in dead limbs of trees and old nest-holes of woodpeckers, and lines the nest with feathers. It has a strange habit of flying around with sharp turns whenever the nest is disturbed, and if a feather is tossed from the nest into the air it will invariably dart after it, and catching it in its mouth will return with it at once, and without regard to the collector replace the feather in the nest. I have known of a number, and have taken three myself by placing my hand over the hole after the swallow had entered. The Violet-green Swallow, while nesting in similar situations, is very shy, and also does not build to any extent in the valley, being found only (to my knowledge) in or near the mountains."

Correction. — In our issue of last March, in an article by Mr. E. J. Smith on the color of birds' eyes, Pileolated Woodpecker should read pileated; Guiard's Jay, Guiana Jay, and the plumage of the Avocet should read fall instead of full plumage.

Common Cormorants in Rhode Island. — A fine specimen of this bird in full breeding plumage was sent to us from Newport, R. I., March 27, and another was received which was killed at Nayatt Point April 10. These are the first specimens taken in this state that have come under our observation.

More Hawk Owls. — One taxidermist reports receiving eighty and another twenty Hawk Owls during the past season. A remarkable fact concerning this bird is that while it visited our three northern states and New Brunswick by the hundreds, to our knowledge not a single specimen has been taken as far south as Massachusetts.

Mr. H. C. Champlin writes us that he has received a partially Albino Robin. The following day we received a similar specimen from Washington Territory. Among our birds the American Robin, or migratory thrush, is oftener than any other species found in an albinistic form. During the past nine years we have owned six fine specimens, one of which, a pure white, is now in the collection of Mr. F. T. Jencks.

The Rodentia of Rhode Island.

(*Continued.*)

THE FLYING SQUIRREL (SCIUROPTERUS VOLUCELLA), (PALLAS), GEOFFREY.

THE nocturnal habits of this beautiful species render an estimate as to its abundance rather difficult. The specimens that have come to our notice have been obtained in Cranston, Johnston, West Greenwich, and Bristol, and it is probable that it is by no means scarce.

The hours of daylight are usually spent in sleep, in hollow trees, often in old nest-holes of woodpeckers, where are born from four to six naked young. April 16, 1884, Mr. Charles Doe found a nest lined with soft hair, like that of a rabbit, with four young, estimated to be only a few days old. It was situated about five feet from the ground, in an old stump so much decayed that it was easily tumbled over and broken in pieces. The mother ran a little distance and stopped, and when pursued made little more exertion than was necessary to keep out of reach, seeming with a method to entice the intruder away from her home. Early in May Mr. Doe found another nest, fifteen feet from the ground, in a maple, and an interesting incident in connection was the fact that in a tree only six feet away was a Red-shouldered Hawk's nest, from which four eggs were taken.

Late in April, 1883, a female was brought to us, and shortly after, four young were born. We fed the family on nuts and fruit; they grew rapidly, and by the middle of July were well furred and nearly as large as the mother. They were charming pets.

According to Dr. C. Hart Merriam, they maintain a liberal diet of nuts, seeds and buds, beetles and perhaps other insects, and do not hesitate to eat flesh, in confinement eating birds' eggs and dead birds, the heads of which they particularly relish.

The mature animal is about six inches long, the tail five inches; the fur is very plentiful and silky; all the upper parts are dark gray, washed over with brown; all the under parts a glistening white, often with a creamy tint; the tail is flat, very closely furred, and usually carried out behind in a graceful curve, or allowed to drop below the body. The large and prominent eyes are a most notable feature; the skin on either side of the body grows out, presenting, when the limbs are extended, a flat surface from the wrist to the ankle. By means of this development it is able to make, with no apparent effort, most astonishing flights or leaps from the tops of tall trees. As Audubon says, "One would be seen darting from the topmost branches, and with wide extended membranes and outspread tail, gliding diagonally through the air, till it reaches the foot of a tree about fifty yards off, when at the moment we expected to see it strike the earth it suddenly turned upward and alighted on the body of the tree."

In the Rhode Island State collection, now at New Orleans, is an albino specimen, reported as captured in Johnston. The entire pellage is a smoky white.

We have never known of a capture during the winter months, nor of the taking of a specimen of the larger species, the Northern Flying Squirrel (*Sciuropterus volucella hudsonius*) (*Gmelin*) Allen. The probabilities are that it does not occur with us. S.

A Seasonable Diet.

MERGANSER GOOSANDER FISH DUCK. — This bird is perhaps the greatest fish murderer extant. Much has been said about the Mink, Otter, Herons, Loons, and Cormorants as fish destroyers, but in many years of experience in preparing specimens I have never before found such a gorge in any of them, and think they are respectable denizens compared to our present subject, which was recently killed at Lake Ontario. I removed 127 fish from its throat, ranging from one and a quarter to three and a half inches in length, and consisting of full-grown minnows, young bass, and others. Whether these were intended for a meal or a lunch only, is hard to determine. The bird evidently was observing Lent with some relish. THOS. W. FRAINE.

ROCHESTER, N. Y., March 26.

MESSRS. DICKEY & ALLEN write: "The iris of the Snowy Owl is straw, of the Sharp-shinned Hawk red, as observed from living specimens. The White Owl was sent from Dakota. We have given him a very large cage. He takes his beefsteak regularly and is not averse to eating roast or stewed beef.

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. II.

QUERCUS OBTUSILOBA — MICHEAUX.

QUERCUS STELLATA — *Willdenow.*

Post Oak — Rough or Box Oak.

The *Q. obtusiloba* is not a common tree in Rhode Island. There is but one locality in the state, known to the writer, where it is found, and that is in the vicinity of the northern bend of Wickford harbor, in North Kingstown. About three miles from Davisville station, on the Stonington railroad, less than a mile from "Devil's Foot Rock," south, and near to, the "Driftway" road leading to the residence of Hon. Joseph Spink, is an interesting group of this species of oaks. They grow upon some ridges of drift or coarse gravel, which slope to, and join, low marshy ground extending to a spur of the harbor. I have been unable to find record of this tree growing upon any other spot so far north as this. Micheaux speaks of it as a notable fact that he found the tree on the west bank of the Hudson opposite New York; and attributes its occurrence at this point to the softening influence of the sea breezes. At Oak Bluffs, Martha's Vineyard, are found many trees of this species, forming, near the shore, a characteristic and attractive feature of the scenery there. The existence of these trees at the Wickford locality is one of several facts connected with the ligneous growth of the state, going to show that in Rhode Island the distinctive floras of the northern and central sections of the country to a considerable extent meet and mingle with each other.

This tree, when well developed, is one of very marked characteristics. In open ground, it forms a low, orbicular head of remarkable density. The branchlets and leaves lap over each other in such a manner as to suggest a thatched roof, and standing beneath it one could hardly catch the sunlight. The tree limbs very low, the branches striking out at first at right angles, later, bending downward, and, generally, much contorted. The leaves have strikingly notable features. They are coriaceous, stiff, dark-green, and very rough on the upper surface; on the lower, whitish, softer and downy. They are on short, stiff, footstalks, and are so arranged at the ends of the branchlets, in close-set, stellated tufts, as to suggest the term, "*stellata.*" The typical leaf has a deep sinus on each side, about one-third from the base, the upper portion being divided into three divergent lobes, which are often subdivided. The buds are short, thick, and rounded, but not large. The acorns are small, nearly sessile, in a broad cup, covered by numerous smooth, close scales. They are sweet and edible, neat and attractive. This oak belongs to the annual-fruited section, and is closely allied with the *Q. alba*. The bark is grayish-white, rough, deeply furrowed, and broken into oblong portions. The wood is highly esteemed for timber, having most of the valuable characteristics of the *Q. alba*, or white oak. This tree grows well on a light, sandy, or gravelly soil, and would probably do so in sheltered places anywhere in Rhode Island. It should be stated that different specimens of the Wickford group of these trees vary so much in essential points as to furnish reliable evidence of their hybridizing with other species of oaks.

Lecture by D. W. Hoyt, on Soundings in and Around Narragansett Bay.

THE twelfth and closing lecture in the Franklin Society course was delivered by Mr. David W. Hoyt, vice-president of the society. His subject was "Studies of Soundings in and Around Narragansett Bay." It was illustrated by maps and diagrams.

After alluding generally to the results of deep-sea soundings, Mr. Hoyt directed the attention of his hearers to a colored map of Narragansett Bay, one color representing the water that is between fifty and one hundred feet deep at the present time, and another color representing the water that is more than one hundred feet deep. He then showed what would be the outline of the coast if the continent were raised fifty feet. In this case every island in the bay would disappear, all of the islands being merged with the main land. Of the bay, only a small river would remain, running from northeast to southwest. This river would be generally half a mile wide, and in no place more than two miles wide. If the continent were raised one hundred feet, all that would be left of Narragansett Bay would be a little patch of water, which would be out some distance in the present Atlantic. This bay that would remain would be very shallow, and about nine miles long and seven miles wide. Long Island Sound would become a small bay, Block Island and Long Island would be one, but Block Island and Martha's Vineyard would not be one. All the islands in this locality would become parts of the main land. Buzzard's Bay would disappear. If the continent were raised 200 feet, all that would be left of Long Island Sound would be two little lakes, all the shoals fifty-five miles southeast of Nantucket would become part of the dry land, and Cape Cod would become extended north to the latitude of Boston. All the water thirty-four miles south of Beaver Tail would disappear. Narragansett Bay would be a deep-seated feature of the earth's surface, many miles south of its present location. The lecturer then went on and explained in detail the wearing away of the coast to its present form, the glacial theory, with which scientists are familiar, and the new theory of the school of younger scientists, who maintained that the earth is rigid, and that the changes on its surface have been caused by the rise and fall of the water. The theory is propounded to account for the change of level that at one pole or the other, great accumulations of ice changed the centre of the earth's gravity, which drew towards themselves the water, and the water being thus drawn towards the ice, changed the level. There is no question that the unglaciated pole would have its water lowered. To the lecturer this theory commended itself in preference to the one that has previously prevailed. In the course of his remarks the lecturer said that Narragansett Bay was not caused by glacial action. It runs back farther than that, although it was doubtless in some respects modified by such action.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER VIII.

3. *Ophibolus doliatus* var. *triangulus* COPE. The Milk Snake, or Chequered Adder, was undoubtedly at one time quite abundant, though its fearlessness in approaching cellars and other frequented places while in search of mice has so often resulted in its death that the species is now becoming quite rare. It is a most beautiful animal, of a milk-color above and ornamented with a dorsal row of brown blotches and two lateral rows of spots of a similar color. The abdomen is silvery-white, tessellated with black. The general outline of the body is slender, the reptile sometimes reaches the length of four feet.

4. *Diadophis punctatus* BAIRD and GIRARD (*Coluber punctatus* LINNÉ). This bright-colored little fellow, the Ring-necked Snake, is quite abundant in certain portions of the State, and is at once distinguished by its white collar and black tie, dark green back and bright orange-yellow front, the ventral scutes often bearing one or more dots. In its habits the Ring-Snake is a most timid animal, spending much of its time hid beneath the bark of old logs or under stones. From its beautiful coloring and pleasing habits this form is often made a pet of, and soon becomes accustomed to its new surroundings. Its food consists of grasshoppers and other insects, to capture which it is often seen, especially after showers, some distance from its place of concealment.

5. *Cyclophis vernalis* GUNTER. The Green Snake is a most gentle and harmless ophidian, allowing itself to be handled in the roughest way without offering the least opposition. Specimens are often captured and made pets of, living in confinement for considerable periods of time. In nature they are found in the moist meadow-lands, where they are concealed by their protective color, and where they find an abundance of insect life well suited for their food. The Green Snake is not alone found on the ground, however, but is an active climber, and may not infrequently be seen entwined among the branches of bushes and low trees.

6, 7. *Elaphis guttatus* var. *vulpinus* Garman (*Scotophis vulpinus* B. and G.). This form, the Fox Snake, has not been recorded in Rhode Island, nor has its congener, the Alleghany Black Snake *Elaphis alleghaniensis*. This latter form has received considerable attention from its distribution. It was first detected in New England along the Connecticut Valley, where it attracted attention as a black snake having the scales keeled, the ordinary *Coluber constrictor* having the scales smooth. Both representatives of Elaphis have been captured in Massachusetts.

8. *Coluber constrictor* Linné, or the Black Snake, is too well known to need specific description. It is found all over the Eastern United States, ranging from Nova Scotia to Texas, and most often found in the neighborhood of water, being particularly partial to thickets of alders, where it can find toads, mice, and birds. As it is an excellent climber, it is often seen among the branches of small trees and bushes, hunting for young birds "in the nest." While on these plundering expeditions the reptile is often followed by a troop of small birds in the greatest flutter of excitement. The Black Snake does not always remain in unfrequented localities, however, but is often surprised in old fields, by the roadside, and will even enter barns and seize chickens. At these times the rapidity with which it retreats on being disturbed has given the animal the name of "Racer." As long as retreat is offered there is no resistance, though if cornered, or during the breeding season, the usual mild temper gives place to a most irascible disposition, which is very characteristic of the animal when in confinement, as it is always quarreling and biting its fellow-prisoners as often as the opportunity presents itself. That he is a constricting snake, as the name would imply, is extremely doubtful, as no representative has ever been observed to kill its prey by pressure of the encircled folds of the body.

The young of this species are peculiar; instead of being black as the parent, they are an olivaceous color, ornamented with a dorsal series of dark-edged brown pots, with lateral rows of spots of still darker shade. The head is dark chestnut mottled with brown.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XVI.

Family 33. Pyramidellidæ, Gray. Not represented in New England.

Family 34. Littorinidæ, Troschel, consists of eight living and two fossil genera. The littorinas or periwinkles are mostly littoral shells, feeding upon sea-weed, and are found on the sea-shore in all parts of the world. Two genera, Littorina and Lacuna, are found in Rhode Island.

Genus Littorina, Ferussac.

Distribution, 175 species, four of which inhabit Rhode Island. Shell turbinated, thick, pointed, few whorled; aperture rounded, outer lip acute, columella flattened, imperforate; operculum pancispiral. Animal edible.

43. Littorina palliata, Say.

Shell globular, solid, smooth and shining, color extremely variable, from pure white, through yellow, orange, reddish, slate and brown to nearly black; sometimes banded, striped or spotted with light and dark shades, but generally of some uniform color; whorls four, the body whorl very large, the others small and scarcely rising above it; spire depressed; apex obtuse; suture very faintly marked; aperture nearly circular; outer lip beveled within to a point, inner lip broadly flattened, white. This shell rejoices in some eight or more synonyms. It was described by Say, *Journ. Ac. Nat. Sci.*, Phila., ii., 240, 1822, under the name of Turbo palliatus, and has been found from New Jersey to the Arctic Ocean; Greenland, Spitzbergen, Finmark and Norway, also in the British Isles. In Europe, it is known under several names, by authors who do not recognize Say as its discoverer. Gould gives its length as eight-tenths of an inch, breadth, nine-tenths. There can be no locality where they are more abundant than in Rhode Island, but they never grow here to near the size mentioned. They are found at Rocky Point abundantly, and in all other places in our bay where there are rocks, feeding upon the rockweed. They are equally abundant on the ocean rocks at Newport, and far up the river where the water is only slightly salt.

44. Littorina rudis, Donovan, 1800.

This shell has more than twenty different names. It is very variable in size, shape, etc., and these varieties have been named over and over again by different authors. It inhabits from Long Island to the Arctic Ocean; Greenland, Iceland, and Europe, and as far south as Spain. The English shells are much larger and more solid than the American, but a variety found there, and called Littorina patula, Jeffries, almost exactly resembles our Rhode Island species. Gould gives its length as one-half inch, breadth, two-fifths; but in this little state shells do not seem to attain the size of those in Massachusetts; at least, some species do not.

This species is found in company with the preceding, on rocks, but generally much higher. They are the first shells to be uncovered by the tide, and are often to be found above high-water mark, where they are only occasionally reached by the spray. They frequent old wharves, and are found more plentifully on small stones than palliata, which prefers rocks.

The principal distinguishing characteristics of rudis and palliata are as follows: Rudis has an elevated spire, with a distinct sutural line; palliata, as described above, is precisely opposite; the surface of rudis is covered with conspicuously cut revolving lines; palliata is smooth and shining; the lip in rudis is compressed in front so as to form an angle; in palliata it is nearly round, and the color of the shell is generally of a uniform ashy gray, or slightly yellowish or olive, although sometimes banded with white, but does not exhibit the variety of colors of palliata. There are several other minor points of difference, but these will sufficiently distinguish the species.

45. Littorina tenebrosa, Montague.

Prof. A. E. Verrill, in *Invertebrate Animals of Vineyard Sound*, page 357, 1874, considers this species only a variety of rudis, but most authors will not indorse this opinion, and, I think, although it resembles rudis very much, its habitat and a close examination of the shell and animal will prove its non-identity. The three species, palliata, rudis, and tenebrosa, inhabit the same extended range, but not the same kind of locality. It is found in salt marshes, on stems of grass and on mud. When the tide comes in it tries to avoid it by climbing up the stems of the grass, and as the tide retires it crawls downward. It observes the same peculiarity of habit when found, as it sometimes is, upon wharves and bridges where the water is sluggish. It would not be found where the current is strong, as under India Point or Red bridge, or on rocks, or exposed to the surf of the open ocean. It is covered by the salt water but a very brief period during the day, and can live out of the water several days. The animal has a dark, olive head; that of palliata is orange. The shell is about the size of Littorina rudis, with a spire not so elevated as in rudis, but more so than in palliata; it has five or six whorls (one more than the other two), marked with revolving lines, but not so heavily as in rudis; its color is dark brown, checkered with interrupted lines or spots of buff color; this is the most prominent characteristic; the interior of the aperture is purplish brown, that of rudis is brown edged with yellowish white, and that of palliata is tinged by whatever color the exterior happens to be.

46. Littorina littorea, Linn.

This shell is *the* periwinkle par excellence; the most abundant shell of Northern Europe, and is consumed as an article of food in immense quantities. Two thousand tons are annually eaten in London alone, employing a thousand people in gathering it. In Liverpool every street corner has its winkle stand, kept by old women, who sell the luscious univalve, boiled and ready to be eaten, just as we have, in their season, baked peanuts, roasted chestnuts, etc., The animals are picked out with a pin, and the shell thrown in the gutter.

In some manner, this species was introduced into Halifax, N. S., where it became naturalized, and has gradually spread down the coast. In a paper by the writer, read before the Providence Franklin Society, Nov. 21, 1871, the remark was made, that "this species has been found on the

(Continued on page xix.)

CONCHOLOGICAL CHECK-LIST. XVII.

J. RITCHIE, JR.

Family. Helicinacea Pfr.
Sub-family. Helicinea Pfr.
Helicina striata Lam.
striatella Pot. et Mich.
striatula Sow.
subdepressa Poey.
subfusca Menke.
subglobosa Poey.
sublævigata Pfr.
submarginata Gray.
substriata Gray.
sulcata Pfr.
sylvatica Orb.
tahitensis Pease.
tamsiana Pfr.
tectiformis Mouss.
tenuilabris Pfr.
tenuis Pfr.
testudinalis Mouss.
theobaldi G. Nevill.
tilei Pfr.
titanica Poey.
togatula Morel.
trochiformis Sow.
trochulina Orb.
tropica Jan.
trossula Morel.
turbinata Wgm.
uberta Gould.
umbonata Shutt.
unidentata Pfr.
unifasciata Gray.
variabilis Wagn.
vernalis Morel.
versicolor Pfr.
vinosa Shutt.
viridis Lam.
vitiensis Mouss.
wrighti Pfr.
zebriolata Pfr.
zephyrina Duclos.
zoæ Pfr.
Schasicheila alata Menke.
bahamensis Pfr.
minuscula Pfr.
nicoleti Shutt.
pennacea Morel.
Alcadia brownei Gray.
citrinolabris C. B. Adams.
Alcadia consanguinea C. B. Adams.
dissimulans Poey.
dubiosa C. B. Adams.
gonostoma Gundlach.
gossei Pfr.
hirsuta C. B. Adams.
hispida Pfr.
hollandi C. B. Adams.
incrustata Gundlach.
macilenta C. B. Adams.
major Gray.
mamilla Weinl.
megastoma C. B. Adams.
microstoma C. B. Adams.
minima Orb.
palliata C. B. Adams.
pusilla C. B. Adams.
rubella Pfr.
solitaria C. B. Adams.
succinea Pfr.
velutina Poey.
Phaneta everetti H. Adams.

Sub-family. Georissea Pfr.
Georissa blanfordiana Stoliczka.
fraterna Theob. et Stol.
frustillum Benson.
illex Benson.
liratula Stoliczka.
pyxis Benson.
rawesiana Benson.
sarrita Benson.
Chondrella striata Pease.

Family. Proserpinacea Pfr.
Ceres salleana Gray.
Proserpina bidentata C. B. Adams.
depressa Orb.
discoidea C. B. Adams.
eolina Duclos.
globulosa Orb.
linguifera Jon.
nitida Gray.
opalina C. B. Adams.
pisum C. B. Adams.
pulchra.
swifti.
Proserpinella berendti Bland.
Cyane.

Random Notes on Natural History.

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Random Notes on Natural History.

A MONTHLY DEVOTED TO THE DISTRIBUTION OF USEFUL KNOWLEDGE CONCERNING THE VARIOUS DEPARTMENTS OF ZOÖLOGY, MINERALOGY, AND BOTANY. 50 CENTS A YEAR.

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WE desire Nos. 1 and 2, Vol. I. To any person sending either of the above, in good condition, we will send RANDOM NOTES for six months; or, if already a subscriber, will add six months to his subscription.

THE annual meeting of the Newport Natural History Society was held Thursday evening at the Redwood Library. The special fund deposited for the aquarium amounts to $1,298.80. Prof. Raphael Pumpelly was elected president for the ensuing year.

The report of the curator contained so many pertinent suggestions relative to the making of natural history collections, that we can do no better than to print, for the benefit of small societies, so much of it as our space will permit After preliminary remarks, the curator said: "A list of the donations is appended to the present report; and the objects themselves, it is satisfactory to state, have during the last few days been deposited in a room, which, after careful consideration, has been rented for one year by the society, as a central depot. This room is in the rear of the Sanitary Association's office, opposite the Redwood Library, on Bellevue Avenue: and, while singularly modest in its dimensions, your council believe it may suffice for some time for the purposes in view. These are to preserve carefully the donations presented, and to have a central point to which further contributions can be sent.

Referring to section V. of your by-laws, I beg respectfully to point out that you have there provided that only such objects as have a scientific value are admissible to your museum. This is a salutary provision, without which, natural history collections are apt to degenerate rapidly into a heterogenous assemblage of odds and ends, devoid of scientific value, and elucidating no leading features or principles.

Your avowed aim is that which should be the guiding theory of all local museums, namely, the formation of collections illustrating the local geology, the local fauna and the local flora; both terrestrial and marine. Such an aggregation of collections, when carefully classified and named, would in time be well worthy of a special building or museum for its reception. To the man of science it would be invaluable for reference; and to our teachers of youth it would be a potent aid in grafting on the minds of our boys and girls that love of natural history, which, wherever their lots may be cast in mature life, cannot but prove an unfailing source of pleasure and improvement.

The second class of objects to be concentrated in your Newport museum of the future, though much less important, must not be overlooked. Specimens belonging to any branch of natural history from other parts of the United States, and series of objects from foreign countries, have a positive value; and it would be a mistake to ignore the deep interest which the general public take in miscellaneous objects of this character.

Section V. of your by-laws reserves space for such; but what is respectfully and earnestly contended for in this report, is the necessity of subordinating this miscellaneous element (which can find appropriate and full development in the general museums of large cities like New York, Boston, or Philadelphia) to the main object our society should keep in view, namely, the formation of local collections.

Some practical suggestions may possibly not be regarded as out of place from your curator in such an initial report as the present one. The following branches of natural history do not present much difficulty in their practical investigation; many of the members may, during the coming summer, collect in the selected departments now specified, namely, minerals, carboniferous and other fossils, shells, of which one member might undertake the littoral, a second the fluviatile, and a third the land shells; insects, one undertaking the Lepidoptera, a second the Coleoptera, and a third the spiders or Arachnida; marine Algæ or sea-weeds, the collection and manipulation of which are well suited for lady members, as their preparation requires both patience and delicacy of touch; plants, one undertaking the grasses, another the ferns, another the flowering plants, and so on. Limitation to one family of a class is a good rule for a collector, for, if too wide a class be attempted, a partial and imperfect list is often the result.

These seem to be the simplest methods by which collections can be set afoot; and afterwards brought into your depository, where the specimens may be identified, named, and a scientific arrangement begun.

All collectors should bear in mind to note carefully the locality from which specimens are obtained, with any special circumstance bearing thereon. In some classes of objects, such as lithological specimens, unless details are recorded with perfect accuracy, and accompany the fragments of rocks, the specimens themselves become quite worthless for any scientific purpose.

These suggestions, admittedly imperfect in their extent, are respectfully laid before you, in the hope that some real out-of-door work may be commenced by the members this year, in the field, on the shore, and on the surrounding waters.

Such work is in itself a reward; and it should be remembered that no matter how small or incomplete our collection may be at first, if investigation be steadily continued, the persistent accumulation of typical specimens in any branch of natural history is virtually the recording in visible forms of actual facts in the domain of nature. Upon such tangible facts, when combined and compared with the mental inductions that follow from previously ascertained phenomena, is formed the true basis on which all scientific conclusions rest.

I have the honor to be, ladies and gentlemen, your obedient servant,"

A. O'D. Taylor, *Curator.*

Newport, R. I., May 7, 1885.

The Rodentia of Rhode Island.

(Continued.)

Muskrat: Musquash, Fiber Zibethicus (Linn.), Cuvier.

Among the wild animals found in this state, the Muskrats are the most plentiful, found everywhere, by pond and river, and frequently in little mud-holes, surprisingly close to active business enterprises. They are, however, armed with abundant cunning and caution, and their presence would, to a casual observer, be unsuspected on account of their nocturnal habits. In some of the streams and ponds in the vicinity of Providence in the early spring and near sundown, they are very active, and even earlier in the day a practiced eye will detect them sitting snugly on some old stump or stone; the chances are, however, that the rat will make the first discovery, and flounce with lightning speed and a noisy splash into the water.

Their summer houses are burrows in the banks and the entrance under water, often at quite a distance from shore. The burrow slants upward towards the surface of the ground and often has side galleries and several points of entrance. I have information of a burrow in Lincoln that can be traced back for thirty feet in a direct line. In these burrows the young are born, from six to eight of them; these large families enable the species to hold its own against its many enemies, gunners, trappers, and, as reported, the fox, mink, owls, and hawks.

The winter huts are composed of grass and roots with very little mud. The shape is that which would naturally occur from piling up matted bunches of grass, about a mouthful at a time, and the entrance is under water. Dr. C. Hart Merriam suggests that these houses serve in part as food. I cannot discover that such is the case in this state, but our winters are not very severe, and there is seldom anything to prevent the obtaining of fresh food, preferable to the dead and dry material of the hut; aside from aquatic plants and an occasional foray upon some vegetable patch, fresh water clams (*Unio*) are their favorite food. These they carry to certain chosen spots before eating them, and the empty shells are found in very considerable piles. I have carefully examined these shell heaps, and, although I sometimes find on the edge of the valves what might be a tooth-mark, the majority of them were uninjured and the others were so slightly broken that it could have done no possible harm to the mollusk. How the animal obtains entrance to the shells remains therefore a mystery. Dr. John D. Godman, in *The Rambles of a Naturalist*, says it is by inserting the claws between the valves and tearing them open by main force. I do not think it possible, as the application of any force would break the delicate edges and the thinnest knife-blade can hardly be introduced between the valves when the mollusk is in a healthy condition.

There seems abundant testimony that some Muskrats eat fish, and perhaps each other. It is certain that they fight furiously among themselves, but of positive cannibalism, or the finding of any fish bones on their feeding grounds, I cannot learn anything.

Mr. N. W. Thatcher, to whom I am indebted for much information, has had large experience, and does not know of any case applicable to Rhode Island, his traps have, however, been several times visited by mink and the confined rat mutilated or demolished, while there are several instances of dead Muskrats lying unmolested for days in ponds where there were other living ones.

Mr. Thatcher bears evidence to their ability to remain under water an astonishing length of time; swimming swiftly away, their course can be determined with some accuracy by minute bubbles that rise to the surface. A most remarkable instance happened in a fresh-mown meadow in East Providence, where the spring rains had left a pond not over two feet deep and entirely surrounded by gently sloping land. My friend with a companion drove a Muskrat into this pond, where it dove and disappeared. After waiting twenty minutes, during which the glassy surface of the water was unruffled, knowing that the creature could not have a burrow in such a place, Mr. Thatcher waded all around the pond and finally across it, discovering through the shallow and clear water the rat lying close on the bottom, where he remained until Mr. Thatcher, coming up carefully behind, planted one foot firmly on him and finally crippled him with the other.

The animal will average twenty-two inches from tip to tip. The upper parts and outside of hind legs are very dark brown, a chestnut brown on the belly sides of head and body, but on parting the hairs an under pellage of light bluish gray is very noticeable, the tail, black, flattened, covered with small scales and sparsely dotted with hairs, is about seven inches long.

* The Muskrat has a wide range through North America and maintains its foothold successfully against the destructiveness of mankind. It extends from the Atlantic to the Pacific, and from the Rio Grande to the barren grounds of Arctic America. The species is quite abundant in Washington Territory, and extends almost to the extreme northwestern point of America.

A specimen curiously albinistic was taken in Cranston, Nov. 11, 1883, and reported in the issue of this magazine, February, 1884.

This article, already too long for our limited space, does not by any means exhaust the subject, and for a most entertaining description of the animal and its habits we recommend our readers to Vol. II. of the *Transactions of the Linnæan Society*, of New York. S.

BESIDES the White-cheeked Warbler which is in my collection, taken May 30, 1879, the capture of which was recorded in the *Nuttall Bulletin*, I have seen one other. It was in the spring of 1880, in a swamp amongst the twigs of a large blooming blueberry bush, sipping the nectar from the little white bells. I was but a few feet from it, and readily recognized it. It was very tame and too near to shoot, but during my efforts to get at a proper shooting distance, it took alarm and vanished from view. J. N. CLARK.

SAYBROOK, CONN.

REMEMBER two very important objects in ventilation, and two which go hand in hand: To *warm* the air, and, at the same time, to *keep it moist*.—*Sanitary Gleanings*.

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* Pacific R. R. Survey, Vol. VIII.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER IX.

WE now come to a genus very generally represented throughout the more temperate regions of the globe, and having in our state three species, all of which are familiar forms.

9. *Tropidonotus saurita* SCHLEGEL, or the Ribbon Snake, is at once recognized by its elongated form, the tail equaling one-half the length of the body from snout to anus. In general coloring it resembles the next species, though the longitudinal bands are generally better defined. This is one of our most abundant reptiles and may be counted by the dozens, by a careful observer, during a half-day excursion in our more moist and sunny fields bordered by hedges. With *T. sirtatis*, it is called the Striped or Garter Snake by those who have not taken the trouble to compare the two. The present species was described as *Entœnia saurita* by the early writers, a name that is still preferred by some.

10. *Tropidonotus sirtatis* (*Entœnia sirtatis* LINNÉ). The Striped or Garter Snake is by far our most abundant ophidian, and is seen everywhere; by the road-side, in stone-heaps, under fences, on lawns, and not unfrequently in old cellars and under outhouses. So familiar is this animal, that a description seems almost superfluous, but that it may not be confounded with the Ribbon Snake, the following points will assist. The body is rather stout, and the tail short, it being only one-fourth the length of the body from snout to anus. In coloring it is rather darker than *T. saurita*, being of a deep brown or black; the dorsal stripe narrow and more or less irregular, and the lateral stripes broad, more or less spotted, and passing gradually into the green olivaceous color of the abdomen.

The two species just described are perfectly harmless, their diet is exclusively insectivorous, and that they should, from a spirit of malicious destruction or from mere prejudice, be mercilessly put to death whenever seen, is the result of a popular tradition of which every liberal-minded man should be ashamed.

11. *Tropidonotus sipedon* HOLBROOK (*Nerodia sipedon* BAIRD and GIRARD). The Water Snake or "Water Adder," is one of our harmless reptiles which are regarded, by many people, as poisonous to the extreme. It differs from the two already mentioned species of the genus, not only in general ornamentation, being of a uniform dark brown color above, shading into reddish on the sides and mottled with dark brown, but in having the scales of the body arranged in a greater number of rows; those of *T. sirtatis* and *saurita* never exceeding twenty-one, while *T. sipedon* has at least twenty-three. This animal is quite abundantly met with along the borders of brooks and ponds, and not infrequently crawls into the neighboring meadows and low lands in search of frogs, where it often meets its death from the scythe. In the water it is very active, often being seen some distance from the shore, swimming around among the lily-pads in search of frogs or fishes, which it is very expert in catching, a pickerel a foot long having been taken from the mouth of one, which was, however, being rather worsted by its "Tartar."

The genus *Storeria* is represented in Rhode Island by two small species. The first has three large, irregular, white blotches just back of the occipital plates, arranged in transverse order, and the scales in fifteen rows, while the second is without the occipital ornamentation, is of a lighter color, and has the scales arranged in seventeen rows.

12. *Storeria occipitomaculata* BAIRD and GIRARD. The Spotted-necked Snake is not uncommonly found along road-sides, where it basks in the sun and finds small insects, on which it feeds.

13. *Storeria dekayi* BAIRD and GIRARD. Like the previous species, is not uncommon. It is fond of the neighborhood of meadows, where it captures grasshoppers, crickets, and other insects. Specimens have been captured from different localities east of the Mississippi, from Maine to Louisiana.

14. *Heteroden platyrhinus* LATREILLE. The Hog-nosed Snake, or "Blowing Adder," or "Flat-head," is quite abundantly found throughout the state, being generally an inhabitant of the more dry and sandy localities. With all its fierce appearance and demonstrations, it is perfectly inoffensive

and cannot be induced to bite. On irritation, it seems to become perfectly exhausted with fear, and will act more like a huge caterpillar than an able-bodied ophidian. The peculiar shaped snout, which is seen in a previous number, in the cut illustrating the plates of the head, is said to be used as a shovel in burrowing. The name "Blowing Adder," has been given from its habit of inflating and spreading itself when surprised.

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. III.

QUERCUS BICOLOR — *Swamp White Oak.*

Of the annual-fruited oaks the two, *Q. alba* and *Q. obtusi loba*, treated of in the previous articles, belong to the lyrate-leaved sub-division, while the remaining annual-fruited oaks of this state are classed with chestnut-leaved sub-division, so called from the resemblance of their leaves to those of the chestnut, *castanea.*

Q. bicolor is frequently met with in the moist springy grounds of Rhode Island. Here, as in the eastern counties of Massachusetts, it forms a notable characteristic in the scenery of swampy regions. It thrives well, too, on ground dry enough for cultivation, if the subsoil be retentive of moisture. This species does not commonly mass itself in forest groups, as other oaks often do, to the exclusion of most other trees; but the specimens are found scattered about in spots specially suited to them, frequently overhanging streams and pools of water. The tree itself is an object of picturesque beauty, often made more so from the situation in which it grows. As finely shaped specimens are found in this state, probably, as anywhere in the country, although they grow larger further south and west. They form a cylindrical head, reaching, in this region, from forty to sixty feet in height. The limbs begin very low, but the lowest are short, irregular and bushy, bending downward as though to reach the ground. An intricate interlacing of the branches is a characteristic of the tree, particularly in exposed situations. The bark on the trunk and larger limbs is whitish, the older portions attached in long, loose scales. The bark of the young branchlets is of a light, grayish green. The foliage is dense. The leaves are wedge-shaped at the base, much expanded above, scarcely toothed, but coarsely sinuate-crenate, downy underneath, particularly when young, having 6 to 8 pairs of primary veins from the prominent mid-rib, which are covered with a rusty down. The leaves are on short foot-stalks, six to seven inches long, two to four inches broad. Several leaves come out close together, the lower ones being much the smallest, and but slightly sinuous. They are thick and leathery, and dark-green above, turning to dull yellow hues in fading. It is easy to distinguish a branch in winter by the short, rounded, obtuse buds. The blossoms appear, in this climate, during the last of May, the male blossoms on threads two or three inches long, from the lower buds only. The female blossoms appear from the axils of the expanding leaves above, single or in twos, upon foot-stalks which increase in length until autumn, when they bear fruit two inches or more from the base. The acorns are roundish-ovate, broad and pointed, in a deep cup, rough outside, sometimes fringed on the margin. The fruit is sweet, not usually abundant.

The wood is tough, compact, and firm, forming timber scarcely inferior to that of the white oak. The heart-wood is dark, the sap-wood light in color, — hence, the term "bicolor." The trees of this species, in this region, exhibit many variations, both in their general appearance and in their details.

Fine specimens of this tree are still growing in Providence, especially on the open lots in the vicinity of "Cat Swamp." The largest in this region, known to the writer, are by the borders of the "Ten-Mile River," below "Hunt's Mills." Its northern limit is the southern part of Maine, but it is found in many localities south to the Gulf states, and west to the Mississippi River. It is a fine, vigorous tree in Rhode Island.

A KNOWLEDGE of science obtained by mere reading, though infinitely better than ignorance, is knowledge of a very different kind from that which comes from contact with fact.— *Huxley.*

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XVII.

47. LITTORINA IRRORATA, SAY.

Syns.:

Turbo irroratus, Say. *Jour. Acad. Sci., Phila.*, II., 239, 1821.

Phasianella sulcata, Lam. *Animaux sans Vert.*, VII., 54, 1822.

Littorina sulcata, Deshayes.

Shell thick, greenish, with numerous raised, revolving, equi-distant lines, dotted alternately with brown and white spots, some round and others like a little dash; the lines growing larger and more raised as they approach the body whorl; spire acute; aperture white, the outer lip thin and lineated with chocolate, the inner lip yellowish brown. Length one inch, breadth three-quarters.

This shell is of southern distribution, ranging from Maryland to Florida, and the northern shores of the Gulf of Mexico. The finest specimens I have ever seen were sent me by Mr. John Ford, of Philadelphia, who obtained them at Atlantic City, N. J., and was surprised at finding them so far north. (See Mr. Ford's article in the March number of RANDOM NOTES, page 21.)

The reader may ask, why, after the above remarks, do you include this species among the Rhode Island Mollusca? In reply I quote from Verrill's *Invert. An. of Vineyard Sound*, page 357, 1874: "Vineyard Sound, sparingly. Long Island Sound, near New Haven, rare. Stratford, Conn., on high sedge (Linsley). Huntington, Long Island, (S. Smith). Many of the shells of this species found on our shores have undoubtedly been brought from Virginia and Maryland with the southern oysters planted in our waters, but it is probably indigenous in certain localities." There are probably more southern oysters planted in Narragansett Bay and Providence River than in any other spot in the world, yet with all our facilities for examining them, I have never heard of Littorina irrorata being found, dead or alive. in Rhode Island.

GENUS LACUNA, TURTON.

Etym.:

Lacuna, a fissure.

Syns.:

Temana Leach.

Dist., sixteen species.

Shell small, ovate conical, thin; aperture semilunar; columella flattened, with an umbilical fissure. One species only inhabits Rhode Island, belonging to the

SUB-GENUS EPHERIA, LEACH.

48. LACUNA (EPHERIA). VINCTA,? MONTAGUE.

Syns.:

Turbo vinctus, Mont., Turt., Wood., Dillwyn, etc.

Turbo quadrifasciatus, Fleming.

Lacuna pertusa, Conrad.

Lacuna vincta, Gould, DeKay, Stimpson, and others.

Shell ovate conic, encircled by four or five purplish-brown bands and very numerous minute undulating lines; spire pointed, composed of five whorls, separated by a fine sutural line of a dingy white or purplish horn color; aperture nearly orbicular; outer lip sharp, thin; inner lip white, flattened and excavated by a smooth crescent-shaped groove, terminating in an umbilicus. Length one-half inch, breadth three-tenths.

New York to the Arctic Ocean; Greenland, Iceland, Lapland, Scandinavia, Great Britain, France; Pacific Coast to Puget Sound; Long Island Sound; Watch Hill, R. I. (four to five fathoms); Vineyard Sound; Buzzard's Bay; very abundant north of Massachusetts Bay; Maine to Labrador.

The names of many shells, as well as of animals and plants well known to naturalists in Europe, have been applied to American species by European and American authors, because they resembled at first sight those with which they were previously acquainted. Upon closer examination, naturalists find those species which were considered identical with those from other countries, to be entirely distinct, and consequently have to be re-named, while their former names, together with their synonyms, are dropped, as they apply to other species. Many naturalists are of the opinion that there are no species of animal or vegetable life, common or identical in two countries separated by an ocean, excepting those introduced by accident or intentionally, thus becoming acclimated.

I do not believe a single species of *terrestrial* or *fluviatile* shells inhabiting the American Continent, to be identical with one from any other country, excepting such species as Hyalina cellaria, Tachea hortensis, and a dozen or so of others which can easily be accounted for. In the case of the *marine* shells, a few of the Arctic species may be identical in Great Britain, Norway, Iceland, Greenland and British America. Thus, Lacuna vincta is an European species, is common in England, and was described by an English author. I have specimens from the coast of Maine which resemble the European shell very much and may be the same species, but those found in Rhode Island do not resemble the Maine specimen or the English ones at all. The description does not apply and its habits differ entirely from that given by authors, viz.: "Found alive among the roots of Laminaria and other marine plants, attached to stones or shells, dragged up by storms from deep water."

We find them in our bay on the sea-weed in company with Bittium nigrum, by wading in the water a foot or more in depth, and even above low-water mark, and on floating sea-weed also. Our specimens are not over one-quarter of an inch in length, the bands on the body whorl varying from one to four, generally a brown narrow line just below the suture, then a broad band of light color, and then two alternate lines of dark and light; some of them have a white line near the suture and another at the base, with a broad brown band between; one specimen I have seen has an ivory-white line at the suture, then a narrow chocolate line, then an ashy-gray broader band, then another narrow chocolate line and another white one, followed by two more alternate brown and white ones, terminating in a brown base.

These shells all have the peculiar fissure at the umbilicus, proving them to be Lacunæ, and as no other species of this genus appears to inhabit this section, may it not be a new species? Possibly they are all young shells, as I have never seen any but full-grown ones from other localities. I shall be pleased to have the opinions of other conchologists on this subject.

FAMILY 35. Planixidæ, three genera and about eighty species, all absent from our fauna.

FAMILY 36. Cerithiidæ, six genera and about three hundred species, is represented in Rhode Island by two genera, Cerithium and Triforis, descriptions of which will be given in the next chapter.

(To be continued.)

June Insects.

DURING this leafy month, when nature's pulses beat most strongly, insect-life is at its acme. The army-worm marches through meadow and grain-field, and a host of destructive species gather force and spread dismay. The woods and meadows abound in gaudy butterflies, and multiform caterpillars feed voraciously. The commoner firefly (Photinus pyralis) rises slowly from the moist ground at eve, and intermits its soft, glowing light. But the month is chiefly characterized by the appearance of that singular periodical, or seventeen-year Cicada (Cicada septendecim), with its *tredecim*, or thirteen-year race. The woods rattle with its hoarse beat about the first of the month, and broods appear in some locality or other nearly every year. The present year (1885) is a memorable one; for a very extensive seventeen-year brood, which appeared last in 1868, and has been fully recorded every seventeen years since 1715, may be looked for on Long Island and in Monroe County, N. Y., in southeastern Massachusetts, in parts of Vermont, Pennsylvania, Delaware, Maryland, Virginia, District of Columbia, in northwestern Ohio, in southeastern Michigan, in Indiana, and in Kentucky. — *Science Almanac.*

POWDER made from the pounded flowers of different species of *Pyrethrum* is a deadly poison to the most of insects, while it is innocuous to man. It is now being cultivated in enormous quantities in California under the name *Buhach*. — *Canadian Science Monthly.*

VENTILATE your sleeping apartment every day after arising; but warm it to comfort before sleeping in it again.—*Sanitary Gleanings.*

The Shad Fishery.

PROFESSOR Spencer F. Baird, of the United States Fish Commission, telegraphed yesterday to Mr. Henry T. Root, of this city, of the State Commission, that one million more of shad would be sent from Washington for the tributaries of Narragansett Bay; and that they were to be placed in the Palmer River. This stream has its head waters in Massachusetts, in the vicinity of the old Orleans, or "Shad Factory," and empties into the bay through the town of Warren. This river for years has been renowned for the immense quantities of shad taken from its waters, its natural conditions being especially favorable for the propagation of this kind of fish. That the United States Government is aware of this is shown by the fact that the number of fish to be placed there now is just double the number sent here in 1881, 500,000 being sent on and placed in the same spot.

The theory in regard to placing these shad is, that they mature in three years and then return to spawn to the waters where they were originally placed. That is, these shad that are placed there now will strive to get back there in 1888, wherever they may happen to be. This is pretty thoroughly demonstrated by the fact that the 500,000 which were put there in 1881 did return in 1884, for shad had never been so plentiful in a great many years as they were in 1884, and are now. Formerly the price was from twenty-five to thirty cents a pound; now good shad are retailing at twelve cents. These fish come gratuitously from the government and cost the state nothing, except the expense of handling them when they get here.

The fish are hatched artificially in Washington in glass jars, under the direction of the United States Fish Commission, the detailed management being under Col. Marshall McDonald, and the government appropriates for this business $250,000 per year. The eggs from which the fish are hatched are taken every day, while the shad are running, from the fish in the Potomac River, and being impregnate with a very small quantity of milt from the male shad, are taken to Washingington every night where they are hatched. The government has stations all along the Potomac River, where the fish are caught in seines. After being hatched they are about half an inch long, and in this form are sent to the various streams throughout the country favorable to the propagation of shad.

Formerly these eggs were hatched in wooden boxes in the current of the Potomac river, but various improvements have been made lately in this hatching process, and now they are hatched in cylindrical glass vessels. The top of the jar is closed by a metallic disk, perforated with two holes five-eighths of an inch in diameter, one admitting the tube which introduces the water into the jar, and the other a tube which serves as an outlet for the water and the removal of the dead eggs from the surface. The current of water flowing in through one of the tubes is introduced at the bottom and filters up through the eggs, enveloping each egg in a stratum of fresh water, and placing each under the best possible conditions of development. The dead eggs will all remain at the top, while the fertile eggs will keep together at the bottom. As soon as the fish are hatched out they begin to swim around vigorously in the hatching jar. They pass into the exit tube and are carried over into the receiver, in which they may be collected to any number desired, being retained there without injury until it is convenient to make a shipment. From 15,000 to 18,000 eggs may be readily placed in each jar. The station where this operation is carried on has the capacity of hatching 21,000,000 at one time, and a capacity of 900,000,000 for one season. This process of hatching is a great improvement over the old system, the incubation of eggs being at first effected in troughs having the bottoms covered with a layer of gravel, upon which the eggs were placed, and over which a current of fresh water was allowed to flow. The system now in use was developed by Col. Marshall McDonald, and was exhibited in May, 1881, before a meeting of the Biological Society held in the basement of the Smithsonian Institution, and in the spring of 1882 it was decided to convert the old Armory building into what is now known as the Central Hatching and Distributing Station.—*Providence Journal, May 9, 1885.*

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Wingless Birds.

African Ostriches.— Well-known examples of wingless or brevipennate birds, all belonging to the true *Cursores;* are the Ostriches, the Emu, and the Cassowaries. The best known species is the Ostrich, *Struthio camelus*, an inhabitant of the African continent. This bird, which has been celebrated since the most remote antiquity, and a dish of whose brains was an epicurean dish in Old Rome, measures from six to eight feet in height; its feet consist of only two toes; the head and neck are nearly naked, the general plumage very lax, the quill feathers of the wings and tail remarkable for the length of their barbs, which, though furnished with barbules, are completely separate from each other, and form the well-known ostrich feathers of commerce. The ostriches live together in large flocks, feeding upon grass, grain, wild melons, etc., and, like the gallinaceous birds, which they resemble in their food, have an enormous crop and a strong gizzard. In a state of nature it picks up and swallows small pebbles; but in confinement it has swallowed brickbats, knives, old shoes, scraps of wood, tenpenny nails, bits of iron, and feathers; one went to the length of swallowing in succession the whole of a brood of young ducks; whether impelled by normal hunger, a morbid appetite, or sheer mischief, is an open question. Another tried to swallow its blanket. The voracity of the Ostrich formerly gave rise to the belief that it fed on iron. The African ostrich is polygamous and gregarious. The female scratches a hole in the sand, in which she lays ten or twelve eggs in an upright position. The male and female both sit upon the eggs during the night, and this sitting, supplemented by the heat of the sun, hatches those in the middle of the nest, the outer ones, when the centre eggs are hard and the young birds nearly hatched, being quite fit for food; the eggs weigh upon an average three pounds, and are regarded as great delicacies. Though equal in weight to twenty-four hen's eggs, one is not thought enough for a meal, and in one instance two men finished five eggs in the course of an afternoon. The approved method of cooking is to place the egg upright on the fire, break a hole in the top, through which a forked stick is forced. This is made to rotate by rubbing with the hands, and so beats up the contents while cooking.

American Ostriches.—The American Ostriches contain two species, *Rhea Americana* and *R. Darwinii*, and are scarcely more than half the size of the African species, from which they also differ in having the head and neck covered with feathers, and the feet furnished with three toes. The feathers of the wing and tail, though elongated, possess none of the beauty of the African ostrich, and are only employed in the manufacture of light dusting-brooms. They are very abundant in the large plains of America. The food consists mainly of grasses, roots, and other vegetable substances, but they will occasionally eat animal food, being known to come down to the mud-banks of the rivers for the purpose of eating the little fish that have been stranded in the shallows. Darwin, who had frequent opportunities of observing these birds, has given an excellent account of their habits. He says: "They take the water readily, and swim across broad and rapid rivers, and even from island to island in the bays. They swim slowly, with the greater part of the body immersed, and the neck extended a little forwards. On two occasions I saw some ostriches swimming across the Santa Cruz River, where it is 400 yards wide and the stream rapid." It is polygamous; the male bird prepares the nest, collects the eggs, which are frequently laid by the females at random on the ground, and performs all the duties of incubation. Darwin says four or five females have been known to lay in the same nest, and the male, when sitting, lies so close that he himself nearly rode over one. At this time they are very fierce, and have been known to attack a man on horseback, trying to kick and leap on him.

The Australian Emu. — The Emu of Australia, *Dromaius Novæ Hollandiæ*, is nearly as large as the African ostrich, measuring from five feet to seven feet in height. It has three toes on each foot, and these are furnished with nearly equal claws. The head and neck are covered with feathers, the throat being bare; the plumage of the body, closely resembling long hairs, hangs down on each side of the body, from a central line or parting. These birds, at one time abundant in Australia, are now becoming extinct, for natives and Europeans are fast thinning them, the former eating the eggs, and hunting down the emeus for food, but not allowing boys or women to partake of it, the flesh being reserved for warriors and counselors. Europeans and settlers run it with dogs, trained on purpose, for food, sport, and also for a valuable oil, of which as much as six or seven quarts are yielded by a single emeu. This oil is of a light yellow color, is used as an embrocation for bruises or strains, and, not readily congealing or becoming glutinous, is also useful for oiling the locks of firearms. The birds are monogamous, the male performing the office of incubation; the nest is made by scooping out a shallow hole in the ground in some scrubby spot, and in this depression a variable number of eggs is laid. Dr. Bennett remarks that "there is always an odd number, some nests having been discovered with nine, others with eleven, and others with thirteen." These eggs are nearly as large as those of the Ostrich, but of a dark green color, and the young, when first hatched, are elegantly striped with black and gray. In defending itself it does not kick forward like the Ostrich, but sideways and backwards like a cow.

The Cassowary and the Mooruk. — The Cassowaries, of which there are two — the Cassowary proper, *Casuarius galeatus*, and the Mooruk, *Casuarius Benettii* — are natives of the Eastern Archipelago. The former, standing five feet high, is distinguished by the possession of a peculiar horny crest or helmet upon the head, by the wings being furnished, instead of feathers, with about five cylindrical stalks, destitute of barbs, and by the large size of the claw on the inner toe. The head and neck are naked and wattled, and of a bright red, variegated with blue. The rest of the body, which is very stout, is clothed with long, glossy black pendent feathers, more closely resembling hair than those of the Emu. It feeds upon herbs, fruit, and seeds, and, like the Ostrich, swallows hard substances. The eggs are of a greenish tint. The eye is fierce and resolute, and the character of the bird is tetchy, and apt to take offence without any apparent provocation. Scarlet cloth excites its ire, and it has a great antipathy to ragged and dirty persons. The height of the Mooruk is three feet to the top of the back, and five feet when standing erect. The color is rufous, mixed with black on the back and hinder portions of the body, and raven-black about the neck and breast; the loose wavy skin of the neck is colored with iridescent tints of bluish purple, pink, and an occasional shade of green; the feet and legs are large and strong, of a pale ash-color, and exhibit a peculiarity in the extreme length of the claw of the inner toe of each foot, it being nearly three times the length of the claws of the other toes. Instead of the helmet-like protuberance of the Cassowary, it has a horny plate resembling mother-of-pearl darkened with black-lead.

The Penguins. — Another set of birds, if not wingless, must also be mentioned. These are the Penguins, in which birds the wings are reduced to a rudimentary character, are destitute of quills, and are covered with a scaly skin, forming flat, fin-like paddles, the scales being rudimentary feathers. In the water, which appears their natural element, they use them in swimming and diving. On shore they use the paddles as anterior legs. From the backward position of their feet the Penguins can only stand in a very upright attitude, in which position they may be seen in countless numbers arranged in as compact a manner and in as regular ranks as a regiment of soldiers, and classed with the greatest order, the moulting birds in one place, the young ones in another, the sitting hens by themselves; the clean birds in another place, etc. So strictly do birds in a similar condition congregate, that, should a bird in a moulting state intrude amongst those which are clean, it is immediately ejected from among them.—*J. W. Wonfor*, *Brighton*, *Eng*.

Our Rhode Island Violets.

To all English speaking people the violet is dear. Perhaps this is from the manner in which it has become enshrined in our literature. The verses of Chaucer, Milton, Shakespeare, Tennyson, Wordsworth, Bryant, are redolent with its sweet perfume. While here in America we have many species of violet, none compare in odor with the familiar English species, the *Viola odorata* of gardens. The first of the native species to bloom here, say about the 20th of April, is the arrow-leaved or *Viola sagittata*. It is found more commonly on uplands, and in meadows, and has leaves ranging from ovate through halberd-shaped, to sagittate. We next find, in more moist localities, say near the margin of swamps, or in wet copses, the *Viola canina*, or Dog Violet. One must not confuse the name of this with the pretty liliaceous plant, called dog-tooth violet, the *Erythronium* of botanists. About the first of May, also in moist places, we begin to pick up the little white violet, with beardless petals, the lower prettily streaked with lines, and with round, heart-shaped or reniform leaves. The flowers are delicately odorous. Growing with this, but usually a few days later, appear the two white species, *V. lanceolata*, and *V. primuliaefolia*.

The yellow, round-leaved violet, *Viola rotundifolia*, is one of our rare plants. It is a dainty little thing with leaves an inch broad at the time of flowering, but increasing to a goodly size later in the season, and finally lying flat on the ground. It is stemless, whereas our other species of yellow violet is leafy-stemmed. This is the downy yellow, or *Viola pubescens*, of which there are two distinct varieties besides the typical plant. These last mentioned yellow violets are quite frequently found in our state, and when found are usually abundant. They are among our choice wild flowers, and are easily cultivated. In a garden they are too prone to spread and prove troublesome.

The blue violet, *Viola cucullata* is common everywhere in low, wet, or marshy grounds, and, as Gray says, "is very variable in size, shape of leaves and sepals, and in the color and size of the flowers, which are deep or pale violet blue or purple, sometimes nearly white, or variegated with white." Of it we have one distinct variety, *palmata*, with leaves cleft or parted.

Our most showy violet is the Bird-foot, *Viola pedata*, which makes, as Hawthorne says, "a gush of violets along a wood-path." Nothing gives us finer masses of color. Take it, as we have seen it, near the Stonington railway, or the Narragansett Pier road, and it is a thing to remember. We read of the field of the cloth-of-gold. Here are meadows painted with most delicate lavender. A very handsome variety, *V. pedata*, var. *bicolor*, is sometimes found, with "two upper petals deep violet, and as it were velvety, like a pansy." The plant does well in cultivation, increasing in size. I should think *Viola Canadensis* might turn up in the state, but I have never found it. I should look for it near Wallum Pond or on the borders of Connecticut.

W. W. Bailey.

Pickle for Skins. Three-quarters of a pound of alum, and one and three-quarters pounds of salt to a gallon of water. Mix and heat to boil; cool in a wooden vessel.

Mr. William G. Smith writes us from Loveland, Col.: "I took a nest of Coot's eggs, on May 30, and after forty-eight hours attempted to blow them, when I found young chicks in them still alive. I placed the remainder under a domestic hen, and, after sitting a few hours, she hatched one out, and prospects are good for hatching them all.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER X.

CLASS — BATRACHIA.

WE have now disposed of those animals of our state which are known as *reptiles;* which have the body covered to a more or less extent with scales, and the toes, when present, armed with claws; and we come to the lower Batrachians, which have the skin unprovided with protective horny outgrowths and the toes clawless.

As was remarked in connection with the reptiles, there has been as yet but little work done in this department, and the number of known species must of necessity be greatly increased by a little exertion on the part of collectors, especially in the more southern portions of the state, where, in localities, the flora is said to resemble to no little extent that of the Southern States.

Our Batrachians may be divided into two branches: Anura, including those forms that, when adult, are tailless, like the Toads and Frogs, and Urodela, the tailed Batrachians, of which the salamanders are illustrative. Of each division there are about ten representatives liable to be found in the state.

1. ORDER ANURA. The genus *Bufo* is represented by the common Toad, *B. americanus* of Le Conte, and *B. lentiginosus americanus* of Cope, an animal inhabiting the entire eastern portion of the continent, and known by all at sight.

In the early spring, and remaining sometimes until late in June, these animals congregate in the warm, shallow pools of our meadows and fairly make the air ring with their trills. While thus calling they seem to be unmindful of danger, and with "croaking bag" inflated, they may be roughly handled without evincing any other signs than those of annoyance. They seem to have no anxiety except that their kin, of afar off, may know of their whereabouts and direct their course accordingly. Hibernation is performed in some shallow burrow in an old field, or possibly in the mud of some pond or spring. Mr. Allen mentions a case where an old well, on being cleaned out, was found to contain several individuals of this species, all in a state of hibernation, and some, judging from the depth of the debris that had collected over them, apparently having been entombed for a length of at least ten or fifteen years; the temperature of the well being considerably lower than that at which they naturally become active.

The eggs of this species are the long slimy ribbons seen so often in the spring, floating or attached to aquatic plants. The tadpoles, the time of the development of which depends on the temperature, are small and black, and can be easily distinguished from the large larvæ of the frogs.

In its distribution the toad is singular, being a more or less local animal, in some situations abounding, while in others it is seldom seen. It is crepuscular, sauntering out during early evening, and often choosing as its route a frequented path, where it is often injured by the careless pedestrian. The day is spent in some retired hollow of the animal's own construction, or under a board or flat rock. The amount of destructive insect life captured in a single evening's stroll by one of these harmless animals is truly amazing. It need never be confounded with any other anurous batrachian, as the jaws are toothless, the toes webbed, and the skin warty — characters which at once distinguish it.

2. *Scaphiopus holbrookii* Baird (*S. solitarius*) Holbrook. The Spade-foot Toad is undoubtedly heard in Rhode Island at times, though of its capture I am not aware. It differs from the common toad in having the jaws provided with teeth, and from the frogs in having the web of the hind feet but poorly developed.

Though a small animal, the Spade-foot's voice is described as being far more powerful than that of the combined energies of all its relatives, and so peculiar as to attract the attention of the most indifferent. Aside from this distinctive peculiarity, however, the animal is characterized by a horny scale on the inside of each metatarsus, which is used in burrowing, and gives origin to the peculiar name "Spade-foot."

As to the habits of this rare animal, they are peculiar indeed. The appearance is only periodical and at chosen localities; sometimes not being heard for years, and then, possibly on the occurrence of proper conditions of weather, appearing in perfect multitudes, only to disappear again so soon as the breeding season is over, and the droughts of summer begin. It is thought that they burrow to some depth in the soft soil of the lowlands, and there remain in a partially torpid state until urged into activity by he advent of a genial spring.

The Breeding-Places of Millions of Sea-Fowl.

At sunset we bade the land good-bye at Sea Wolf Island, and laid our course for Bird Rock, in the mighty Gulf of St. Lawrence. All night and all next day not a sheet was touched, the wind holding fair and steady, and at dark we shortened sail that we might not run by the rock in the night, or worse yet, run into it. Our pilot was a young fellow of eighty-one, who all his life had been a fisherman, and had been to the Labrador coast so many times that he had lost the record. Coming on deck that evening, I found the staunch old man on the lookout forward, as we had sworn friendship before this. We sat and talked as the schooner slipped quietly along through the dark water.

I told him of how, in boyhood's days, I had read of the great Bird Rock in Audubon; how in later years, in distant lands, I had visited the breeding places of many different birds, but this rock was my earliest love, and of my anxiety to see it. Touched by my eloquence, the old man swore he would make no errors, and that next morning early we would be there. "For," said he, "with the wind a leetle in my favor, I can smell it twenty-five mile off."

With which assurance I was fain to trust to him and turn in, and sure enough at daylight there was the great rock looming up ahead, and what a sight it was, well worth the trip for itself alone. Many able pens have described it, and, as I think, having seen it, with poor success, so I will not attempt it; but you must try to imagine a high, triangular-shaped rock, with precipitous sides 400 feet in height, towering up in the lonely waste of waters, fifty miles or so from the nearest land, each face of the rock a half a mile in length. Against its foot the waves break and roar eternally, and all the seams and ledges of its steep face above the seething sea are white with breeding sea-birds, as though a heavy snow-storm had just visited it, and all the air around it for miles is filled with flying, circling, plunging sea-fowl. Here, for ages past, the gannets, gulls, auks, guillemots or murres, etc., have nested in safety, as numberless as the blades of grass of a vast prairie.

It was a sight to see, not to describe, and the most thoughtless youngster on board gazed in wonder at a scene I warrant he will not forget.

(The Canadian government has now, at great expense, placed a light on the summit of the rock, and the birds, alas! will have to scatter, and find another resting-place. Where they may go it is hard to say, for there is none so secure as that. Vast numbers will linger there for years to come, no doubt, but the bulk of them will seek new quarters.

. . . .

At Murr Rocks, behind which we ran for shelter, we found a couple of fishermen's huts, and going ashore we bought several bucketfuls of murrs' eggs, which had been gathered earlier in the season, and put in brine. In this way they keep good a year. The way fresh eggs are made sure of is this: A party visits the rock on which the birds breed by the tens of thousands, selecting a place of an acre or so, they smash every egg on it. Marking the spot, they go again in a couple of days, and all the eggs they find there are of course fresh. In former years a regular business was carried on by the eggers, and vessels were loaded with them for the Canadian markets. This wasteful method promised soon to exterminate the birds, and the Canadian government very properly put a stop to it. Now they are once more abundant, and supply the natives with a very important item of food. The murr egg is one of the most curious in nature. It is as large as a domestic duck's, but pear-shaped; the ground color is either green or white, and it is dotted, splashed, and streaked with blotches and lines of black and dark umber. Each bird lays one egg on the bare rock.—*Deck, in Prov. Sunday Telegram.*

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XVIII.

THE Cerithiidæ family, or Cerites, are a very numerous group of turreted shells, with a notch or canal in front. They are found in all parts of the world, but the typical species are tropical in their distribution. They inhabit salt, brackish, and fresh water. The genus Potamides, Brong, or fresh water Cerites, numbering about fifty species, are all tropical or sub-tropical, living in fresh and brackish water (streams and swamps). The genus Cerithium, Brug, contains about one hundred and forty species, distributed among thirteen sub-genera, two of which, Bittium and Cerithiopsis, are represented in Rhode Island, each by two species.

49. CERITHIUM (BITTIUM) NIGRUM, STIMPSON.

Syns.:

Cerithium reticulatum, Totten, *Am. Jour. Sci.*, XXVIII., 352.

Pasithea nigra, Totten, *Am. Jour. Sci.*, XXVI., 369.

Cerithium Sayi, Menke, Gould, DeKay, Stimp.

Dist., Mass. Bay to South Carolina.

Shell small, turreted, whorls six to eight, the upper ones of a dark bluish or blackish color, the lower ones of an ashy gray; surface covered with about twenty ribs, reticulated by revolving lines, of which there are six on the second whorl, five on the next above, and so on; on the body whorl the net work extends downward to the centre; below this are six revolving lines, without the ribs; aperture one-fourth the length of the shell; outer lip sharp, scalloped by the revolving lines; canal a mere fissure; shell umbilicated. Length three-tenths, breadth one-tenth inch. The young of this species are found very abundantly on the sand between tides at Nantucket, Martha's Vineyard, New Bedford, Narragansett Bay, and Long Island Sound. These are always reddish black and have a round aperture, or nearly so. The adults are found from low water to eight fathoms on algæ and eel grass. They attain their growth in two or three years, and when full grown have an oblique aperture, flaring at the base and suddenly everted.

50. CERITHIUM (BITTIUM) GREENII, ADAMS.

Shell small, reddish black (resembling very closely the young of the preceding species), elevated-conic, whorls ten to twelve, flattened, traversed by numerous ribs, of which there are on the body whorl, from twenty to twenty-five, crossed by three revolving lines, producing three sets of granules, the lower one the largest, so that the base of each whorl appears to jut over the other; as these lines revolve up the spire, the lower one disappears, then the middle one, and finally the last one vanishes, leaving the upper part of the shell near the apex quite smooth; two black threads emerge from the aperture and revolve around the base of the shell; aperture one-eighth the length of the shell, nearly circular, with a deep but short canal, partly closed over by the lips. Length one-fifth of an inch, breadth one-twentieth. Found by Prof. C. B. Adams on seaweed in Dartmouth Harbor, a few feet below low water mark, and described by him in the *Jour. Bost. Soc. Nat. Hist.*, II., 287. It inhabits the same localities as nigrum, but is not at all common in Rhode Island. Very rare at New Haven (Perkins). Boston Harbor (Stimpson). Long Island (S. Smith). Fort Macon, N. C. (Coues).

51. CERITHIUM (CERITHIOPSIS) EMERSONII, ADAMS.

Shell small, conical, glossy, reddish-brown; whorls sixteen or seventeen, flat, each with three rows of granules; suture deeply impressed; aperture small, one-sixth the length of the shell, with a short, twisted canal; outer lip crenulated. Length one-half inch, breadth one-eighth.

Discovered at Nantucket, and in New Bedford harbor, by Prof. C. B. Adams, and described in the *Jour. Bost. Soc. Nat. Hist.*, II., 284, under the name of Cerithium Emersonii, in honor of the president of the society, Mr. G. B. Emerson. Huntington and Greenport, Long Island (S. Smith).

Cape Cod to South Carolina (Verrill). I have found but one specimen in Rhode Island.

52. CERITHIUM (CERITHIOPSIS) TEREBRALIS, ADAMS.

This species inhabits the same localities, and is of the same shape and size as C. Emersonii, but the surface of the shell, instead of being granulated, has three sharp, elevated revolving lines on each whorl, of which there are ten, and numerous fine, longitudinal lines between the ridges. It was discovered at New Bedford by Mr. C. F. Shiverick, and described by Prof. C. B. Adams, in *Jour. Bost. Soc. Nat. Hist.*, III., 320.

GENUS TRIFORIS, DESHAYES, 1825.

Shell sinistral, turreted, sculptured, granular; aperture small, produced anteriorly into a closed tubular canal.

Dist., about one hundred species, one of which inhabits Rhode Island.

53. TRIFORIS NIGROCINCTUS, ADAMS.

Shell small, blackish red, granulated by three revolving series of beads; whorls twelve, reversed, the aperture being sinistral or left-handed, differing in this respect from any other marine shell we have within our limits; spire acute; aperture oval, one-fifth the length of the shell, ending in a twisted canal one-third the length of the aperture, situated on the left side of the shell. Length three-tenths inch, breadth three-fortieths.

The name, nigrocinctus, was not well chosen for this species, as the shells when fresh are of a uniform color, the black revolving line at the suture being scarcely distinguishable. In faded or light colored specimens it is very apparent. However, it cannot be mistaken for any other species inhabiting our coasts. It was discovered by Professor Adams in Dartmouth harbor on seaweed, and described by him in *Jour. Bost. Soc. Nat. Hist.*, II., 286. Gould's *Invert.* gives no other locality. Perkins says they are rare at New Haven. Verrill gives from Cape Cod to South Carolina. We find them here on Ostræa Virginica, attached to the dead shells lying in the heaps thrown out by the oyster-openers in different parts of the city.

(To be continued.)

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. III.

QUERCUS PRINUS — CHESTNUT OAK.
Var. monticola.

There are at least three varieties of the *Q. prinus* in Rhode Island. The variety *monticola*, rock-chestnut oak, is found upon some of the rocky hills of the state, quite abundantly upon the ridge of which the Diamond Hill granite quarries form a part. The trees now standing upon this ridge are generally small, being mostly sprouts from a growth cut ten or more years ago. It is rare to find a well-developed tree of this species in this state. The largest which I have seen are not more than a foot and a half in diameter and about twenty-five feet high. In the open ground the tree grows to a low, rounded head, symmetrical and of considerable beauty. The leaves which I have gathered average seven inches in length, including the petiole, which is about one inch long. The general shape is obovate, considerably narrowed at the base, the widest part being fully half its length. The margin is distinctly, but not deeply toothed. The midrib sends out from six to twelve pairs of straight, prominent veins, which determine the number of teeth. The leaves are of a shining green above, lighter, and, when young, downy beneath. They clothe the tree with a dense foliage.

The tree fruits but sparingly, and the acorns, being very sweet, are quickly taken by the squirrels, so that it is difficult to get well ripened specimens. The acorns are large, in rough cups, not distinctly scaled, borne upon footstalks about one inch long. The branches come out at sharper angles than is common with most other oaks, and are finely divided at the extremities. The bark is smooth until the tree is quite old, when it becomes divided by clefts, long, but not deep, and quite near each other. The bark resembles that of the chestnut tree, but is somewhat lighter and very compact.

Where this tree is found in sufficient quantities it is highly esteemed both as timber and fuel; but in Rhode Island it is so scarce that its characteristics are but little known. It will thrive among rocks and in the fissures of ledges, in the dryest places, wherever it can get a foothold. Upon many rocky hills of this state it would be valuable for propagation.

Var. humilis.

CHINQUAPIN OAK.

We are accustomed to associate strength, massiveness and grandeur with the name "oak"; but the *Q. prinoides*, commonly known as the *chinquapin oak*, is a pigmy in the family, growing only from two to four feet high and an inch or two in diameter. Its native habitat is upon dry, sandy, or gravelly plains and ridges and among ledges where little soil is found. Its usual companion is the "scrub" oak, which, although but a large shrub in size, quite overtops it, and obscures it from ordinary observation. It usually sends up a half dozen or more shoots from one root, although occasionally but a single stem, it then being a perfect miniature tree, laden with flowers, in early June, or with fruit in autumn. The catkins of sterile flowers appear in clusters, two inches or more in length, a rich saffron in color, graceful and beautiful. The acorns, although small compared with those of many other oaks, often bear the stems to the ground with their weight. They are set in dainty, obscurely scaled cups, narrowed at the base, nearly sessile, each being usually accompanied by one or two abortive acorns. The acorn itself is ovoid or subglobose, of dark brown, almost ebony color, and shining when ripe. Wild animals, birds as well as quadrupeds, and swine devour the acorns with avidity, which are sweet and nutritious. The leaves are obovate in shape, considerably narrowed at the base, upon foot-stalks one-half inch in length, dentate—wavy upon the edge. They have a prominent midrib, sending out seven or eight pairs of straight, alternately arranged veins, distinctly reticulated with each other. The branches are straight, coming out at sharp angles, and are of a light-gray, or ash color, the main stem being nearly black and frequently variegated by light patches of lichens. The bark is excessively bitter, abounding in tannin.

The use of this tree is evidently as a "nurse," or protector, for certain timber trees, when young. Such trees planted among the "chinquapins" would get established, and overtopping them, leave them to die, or as a harmless undergrowth. When forestry shall have attained its proper place in this country, the utility of some of our shrubby growths, now regarded as worse than worthless, will be duly recognized.

I first learned of the existence of this interesting member of the oak family in this state, by reading the remarkable works of Micheaux, the elder and the younger, upon the trees of North America. He says that it is found in abundance upon the plains of Providence. My search was first rewarded by finding it in North Providence, among the "scrub" of the unsettled parts, where it still exists. Since then, I have often come across it in rambles in various places, but in nearly every instance upon sterile soil. Emerson speaks of it as often occurring in Middlesex County, Mass., and as occupying, almost exclusively, acres of ground upon Martha's Vineyard.

Color of Birds Eyes.

Downy Woodpecker, dark red, hazel.
White-headed Woodpecker, red.
Red-shafted Woodpecker, red or brown.
California Woodpecker, white, sometimes yellowish, bluish, or brown.
Williamson's Woodpecker, red brown.
Ivory-billed Woodpecker, yellow.
Pileated Woodpecker, yellow.
Black-backed Woodpecker, brown.
Banded-backed Woodpecker, brown.
Red-bellied Woodpecker, red.
Yellow-fronted Woodpecker, red.
Red-headed Woodpecker, brown.
Lewis' Woodpecker, brown.
Hawk Owl, yellow.
Great Gray Owl, straw.
Saw Whet Owl, yellow.
Long-eared Owl, yellow.
Short-eared Owl, yellow.
Richardson's Owl, straw.
Little Screech Owl, straw.
California Screech Owl, yellow.
California Pigmy Owl, yellow.
Burrowing Owl, yellow.
Great Horned Owl, yellow.
Barred Owl, dark brown iris, deep blue pupil, effect black.

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Notes on Food of Raptorial Birds.

BY CHARLES DURY.

The hawks and owls are popularly regarded as very injurious birds, and always killed when opportunity presents itself.

The food of many species varies much with the season, and it is rather astonishing that our resident species are enabled to find subsistence during very severe winter weather. I give, in a brief manner, the result of the dissection of the bodies of the following species, from my note-book of 1884 and 1885:

Red-Shouldered Hawk (*Buteo lineatus*).

Dec. 4, 1884. Male. Filled with grasshoppers. Bird killed near Winton Place.

Nov. 13, 1884. Male. The stomach was filled to distention with grasshoppers (*Caloptenus femer rubrum*).

Dec. 2. Male. Filled with grasshoppers and mice. Several others examined during winter, contained mice.

The remarkable fact here is, that this species feeds on grasshoppers, and can find them as late as Dec. 4th.

Bald Eagle (*Haliaetvs leucocephalus*).

Nov. 10. Young female contained fish.

Jan. 15. Young (very large) female contained balls of rat-hair.

Rough-Legged Hawk (*Archibuteo lagopus*).

Jan. 15. Female. Stomach filled with parts of four large field mice.

Jan. 27. Male. Filled with mice.

This is rather a rare bird in this locality.

Great Horned Owl (*Bubo Virginianus*).

Several examined were empty, but the stomach of one male on May 13th, contained a few feathers, a small bunch of hair, and a beetle (*Lachnosterna fusca*).

Nov. 20. Female. Contained a quail.

Nov. 24. Male. Contained part of a chicken.

Barred Owl (*Syrnium nebulosum*).

Nov. 11. This bird contained a partly-digested screech-owl (*Scops Asio*), feathers, body and feet.

Nov. 30. Male. Contained mice.

Jan. 16. Female. Contained mice.

Jan. 16. Male. Stomach contained part of a red-bellied woodpecker, including head and bill.

Short-Eared Owl (*Brachyotis palustris*).

Nov. 9. A male was filled with mice — several others contained mice.

Nov. 11. A female contained two European sparrows, for which service she deserved a better fate than to be shot.

Cooper's Hawk (*Accipiter Cooperii*).

May 11. Stomach contained young bird.

May 24. Male. Stomach contained partly-digested hermit thrush.

Feb. 7. Stomach contained one European sparrow.

Barn Owl (*Strix Flammœ*).

Since my paper published in the Journal, Dec., 1883, several others have been taken in this vicinity; in all of them were mice and their remains.

Sharp-Shinned Hawk (*Accipiter fuscus*).

Jan. 18. A sharp-shinned hawk, a male, pursued a European sparrow into a store on Third Street, this city, and captured the sparrow inside the store. The door was closed and the hawk secured alive.

Screech-Owl (*Scops Asio*).

This species has been unusually abundant; very many have been examined. I enumerate a few of these.

April 10. Male. Filled with insects, mostly beetles.

May 22. Female. Contained beetles.

Oct. 10. Eight owls, in all of which were insects, mostly beetles.

Nov. 8. One owl contained millipedes.

Nov. 24. One owl, male, contained insects.

Dec. 5. One owl contained mice.

Dec. 11. One owl contained mice.

Jan. 13. One owl contained thirteen large larvæ, commonly called cutworms (larvæ of *Agrotis*), and several *millipedes.*

Jan. 25. One owl contained mice and one European sparrow.

These little owls are very beneficial birds. They seem to feed on insects, in preference to anything else, if they can get them. I have been puzzled to tell where the owl of January 13th obtained the cutworm larvæ. The bird seemed to be a resident, as its feathers were soiled with black coal soot, commonly seen on the birds that linger long in the vicinity of the city. The raptorial birds are almost always very fat, proving they take good care of themselves.

NOTE. — Since the reading of this paper, the letter appended has been received. It explains itself:

CIRCLEVILLE, March 5, 1885.

MR. CHARLES DURY:

Dear Sir — I noticed a report in yesterday's *Daily Enquirer*, of a paper read by you before your Society of Natural History, on Rapacious Birds.

Allow me to add some testimony to our much-needed knowledge of birds of this class.

For many years I have personally known the value of our large horned owl as a "ratter," and will cite one instance in particular as proof.

About eight years ago, one of my men discovered a pair of owlets of the large-horned variety, in an old sycamore stub, near my stables on my farm, and concluded to capture them alive. With some risk to himself, he succeeded in securing them, but not without a regular fight with the old ones, who gave him a few wounds. In the nest where he got the young owls, he noticed several full-grown Norway rats, with their skulls opened, and the brains removed. On descending to the ground, he also noticed the bodies of many rats around the tree, and out of curiosity counted them, and found the bodies of 113 rats, most of them full-grown. They all appeared to simply have had their skulls opened, and the brains removed; and from their undecayed appearance, must all have been captured within the previous week, or ten days.

On account of their nocturnal habits, from my personal experience and observation, I consider the owl, especially the great horned owl, a bird of great value to the farmer, especially as a ratter.

Yours, O. E. NILES.

Journal of the Cincinnati Society of Natural History, April, 1885.

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. IV.

Quercus prinus.

(Variety unnamed.)

OF the biennial-fruited oaks found in Rhode Island there is a single specimen belonging to the chestnut-oak division, which deserves special mention. I do not find any description in botanical works by which it can be identified as any named variety. I am inclined, with some of our local botanists, to regard it as a hybrid, probably of the *Q. alba* and *Q. bicolor*, both of which are found abundantly near it.

So far as the writer can learn, no other specimen of its peculiar characteristics is known in this state or elsewhere. The view of this being a hybrid is the more probable from the well-known tendency of the oaks to cross.

This tree is located in Providence, a half mile from Seekonk River, in an unimproved lot near the junction of Arlington and President avenues. It is about forty feet high, with wide-spreading top, the lower limbs striking out horizontally, but not having the contortions common to the white oaks. The general aspect of the tree, however, in the distance is that of the white oak. The bark resembles that of the sub-division to which it belongs, being much like that of a chestnut tree. The leaves are peculiar. They average with the petiole, which is about an inch long, seven inches in length, and half as wide. They are ovate in shape, narrowed at the base.

The prominent mid vein sends out six or seven pairs of prominent lateral veins, at sharp angles, which determine the number of divisions of the leaf blade. The margin is deeply indented, the sinuses being fully an inch cut, with one-third that width. This gives a more prominently toothed division to the leaf than is found in other varieties. The branchlets are heavily foliaged, the leaves lying upon each other in an imbricated manner. The young leaves are slightly downy underneath, pale green, darker above. The foliage of the tree is certainly characteristic and remarkably attractive.

The fruit marks the tree as varying from the named varieties of the *Q. prinus*. It is fully one and a fourth inches in length, in a cup one third as deep, prominently tubercled. The fruit resembles that of the English oak, *Q. robur*.

The wood, as examined from a dead branch, is coarse grained, and of dark color.

The tree described is dying rapidly. One half will not leave out again; the other part appears vigorous at this writing, and is fruiting abundantly, this year. It has fruited but sparingly for several years, last year not at all. The variety is certainly worth propagating, not alone from its rarity, but from its beauty as a shade tree.

It should be remarked that the soil upon which this tree grows is a rich loam, moist but not swampy, and it is in a sheltered situation, with ample room for development.

This completes the list of annual-fruited oaks in Rhode Island, unless a doubted report should prove true, that the mossy-cup white oak, *Q. macrocarpa*, is to be found in the northwestern corner of the state.

Recapitulation of the annual-fruited oaks:

WHITE OAK DIVISION.

Q. alba — White oak.
Q. obtusiloba — Post oak.

CHESTNUT OAK DIVISION.

Q. prinus.
Var. bicolor — Swamp chestnut oak.
Var. monticola — Rock chestnut oak.
Var. prinoides — Chinquapin oak.
Var. not named.

WHAT is meant by the bone of contention? The jaw-bone.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XI.

WE now come to the arborial Batrachians, the tree-frogs, or, as they are more commonly called, the "tree-toads." These animals have teeth in the upper jaw and on the palatine bones, the latter appearing in the center of the roof of the mouth. The toes are all provided at their extremities with sucking-disks, and those of the hind limbs are more or less united by a web. By means of these sucking-disks, and assisted by a viscid fluid, secreted from the lower surface of the toes, the tree-toads can, not only secure their hold on the slender branches of the trees and fearlessly jump from bough to bough, but they can crawl up the smooth surface of a window-pane or the perpendicular walls of a room. The palmation of the hind limbs is of use with our forms only during the breeding season, when the males and females congregate in the warm pools and shallow pond holes, making the air ring with their shrill pipings.

Hyla versicolor Le Conte. The common tree-toad is one of the most beautiful members of the genus, and well merits its specific name, as it possesses the power of changing its hue to a most remarkable degree. Ordinarily when found it is of a greenish white shade, a color giving the crouching animal the appearance of a piece of putty. In the angles of the legs, as well as on the sides of the abdomen, a beautiful bright yellow obtains. The pale white is, however, soon changed to darker shades and may become almost brown, a shade which harmonizes with the limbs of the trees on which the animal lives. The length of the body, exclusive of the hind limbs, is about two inches. The "trill" of the tree-toad is familiar to all as a call heard during the warm, sultry evenings of spring and summer, and resembling the noise produced by a watchman's rattle.

When thus calling, the animal may be easily found by a person locating himself near the base of the tree in which the animal rests, and observing the bases of the several limbs as they spring from the trunk. The animal generally chooses this situation for his calling tower, and so interested is he in his vocal powers that rather than leave off in the midst of his piece, he will allow himself to be taken in the hand.

In captivity the tree-toad makes an interesting, though noisy pet. A starch-box containing some damp moss and a small dish of water, and well supplied with insect life, will render the animal perfectly contented, and he will live in health during the season. Even in their out-door life, the tree-toads seem to be of a most contented disposition. An individual has been known to remain in a single tree for months at a time, and possibly for successive years. Specimens have been found hibernating in the dead wood at the bottom of hollow trees, and also in the soil among the roots.

The Rodentia of Rhode Island.

(*Continued.*)

WHITE-FOOTED MOUSE; DEER MOUSE; FIELD MOUSE; HESPEROMYS LECOPUS (RAF) LE CONTE.

I HAVE before me ten specimen skins of this small Rhode Island Mouse, the pellage varying from leaden gray with a slight rufus tint along the sides, the under parts and feet white, in a young specimen taken Nov. 19, 1884, to the full coloring of adults taken at different seasons, which is a soft yellow brown color above with the back dark, where the hairs are tipped with a darker shade nearly black, all the under parts, the feet and the under part of the tail, pure white. The average length from nose to tail is three and one-half inches, the tail nearly as long as the head and body. The eyes are mild, round and full, standing out prominently from the head.

I have found this species abundant in the central and eastern part of the state, and as it seems to adapt itself to almost any sort of field or woodland, it is probably plenty everywhere. It is a nimble little creature, and the second one I ever caught sought safety by running up a slender tree some twenty feet, and when my companion followed it jumped boldly off, and very nearly escaped me. The memory of that large man shinning a tree for one small mouse is now a little amusing.

Mr. Daniel Seamans caught, May 18, near Rockland, R. I., a fine female, and for two days I had her alive. She allowed any amount of handling, without attempting to bite, and I anticipated much pleasure in studying her habits; but the following morning she was missing, and the head was eaten from a dead snake that had been left near the cage. During captivity she ate freely of crackers, canary seed, cheese, meal, and clover. The afore-mentioned incident proves also some carnivorous propensities.

From three to six young are said to be produced at a birth, at any time from April to November, and there are probably several litters each season.

All the nests that I have found were of grass and dead leaves, nearly round and slightly matted, and placed in holes in trees from a foot to five feet above the ground. Dr. Merriam says, that in certain open situations, they excavate chambers in the earth several inches below the surface; in these various situations they hibernate somewhat irregularly during the coldest weather. Mr. J. A. Allen, in the Bulletin of the Museum of Comparative Anatomy, says he has found as many as five huddled together in a torpid state, while Dr. Merriam reports them as abroad except during the most severe weather. For their winter needs they lay up a large store of seeds. Dr. Merriam says he has removed two quarts of shucked beechnuts from a single hoard.

It would seem that Hesperomys, like the common House Mouse, sometimes exhibits remarkable vocal powers, a song well continued of considerable compass and very soft and clear. In the *American Naturalist*, May, 1871, and December, 1871, are two interesting reports upon this subject.

THE King Rail, in my collection, was taken in Saybrook, January 14, 1876, near the west shore of the Connecticut River. It was started by the dog from a patch of rushes, whence it rose and flew a short distance, its flight resembling that of a duck, which, at first sight, it was supposed to be. I have heard of the Rail hunters securing others, but this is the only one I have had. I once found a nest of this bird here, and have some of the eggs yet, but it was many years ago that I took them. J. N. CLARK.

Buttercups.

FEW persons realize how many different kinds of buttercups we have here in Rhode Island. The bulbous species, which is naturalized from Europe, and mostly restricted to our Eastern sea-board, is the first to appear. It fills one with joy, as does the first dandelion. Its bright yellow cup, polished and shining, is well beloved of children. They gather large handfuls of buttercups to test their own appreciation of butter. Ere the bulbous species has entirely disappeared from our lawns and meadows, comes the later *Ranunculus acris*, very handsome in leaf and flower, but in neither so showy, in our opinion, as is the creeping buttercup, found in wet places. The early crowfoot, *Ranunculus fascicularis*, is very local with us. We have found it but once, in East Providence. The bright yellow flower is an inch broad, and the plant is known at once by its cluster of thick, fleshy roots.

Besides these species, we have the two curious aquatic species, one with white flowers (*R. aquatilis*), and the yellow-flowered *R. multifilus*. The last, which is smooth when growing in water, becomes hairy in its occasional terrestrial forms. It is, when in water, isolated from insect molestation, but, when the water is removed, requires to protect itself by pubescence. One of the noticeable things about the white water-crowfoot, is its frequent development of two sorts of leaves. Of these, the immersed kind consists of long, capillary divisions, while the floating ones are round, flat, and lobed. Again, we have the larger and smaller spear-worts, though these are local in their distribution. The seaside species, *R. cymbalaria*, is more commonly seen. It is found also near salt springs or lakes, as in New York State, in Nevada, and in Utah. Two very small-flowered species of buttercup we now find in blossom in damp woods. These are the species *abortinis* and *recurvitus* of botanists. To us they possess beauties, perhaps not obvious to those who fail to perceive that a weed is "but a flower in disguise."

It will be seen from this list that we are well provided with buttercups. Undoubtedly many of them are unmitigated weeds, to be warred upon always and everywhere. But we must be pardoned for thinking that without any buttercups one would be less rich. Their gold is cheap, it is true, but it is sterling. We could better spare some more pretentious flowers.

W. W. BAILEY.

JUNE 15, 1885.

MR. S. Schollfield, of Providence, has brought to our notice a rose in full bloom. From its centre among the stamens had grown out a new stem, terminating in a perfect and quite well developed bud. We referred the specimen to Professor W. W. Bailey, of Brown University, and he has favored us with the following article:

MY DEAR SIR: The rose you send me illustrates what is known as prolification of the flower. It is interesting as bearing upon the theory of metamorphosis as made known nearly simultaneously by Wolff and Goethe. It is in effect a flower reverting to a leafy branch. Often the change, especially in roses, is complete, the petals changing into green leaves. We understand a flower to be a branch metamorphosed or changed, or perhaps it is better to say, *specially developed*, for the accomplishment of reproduction. Upon this branch the leaves are modified into petals, stamen, and pistils, a higher grade of organs than foliage-leaves. But unusual circumstances, such as excess of moisture, may induce a branch which had begun to develop into a flower, to revert to the lower function of leaf-producing. This is what has happened here.

MR. Geo. H. Ragsdale, Gainsville, Texas, sends us a double nest, about which he writes as follows: "The two nests sent last week in the bunch of mistletoe I take to be those of the Orchard Oriole and Lark Finch, the latter built in and on the former, probably after the Orioles had vacated. The nests were placed in a Black Jack tree thirty feet high."

A MAGAZINE writer asks: "How shall we utilize the Indians?" This is a difficult question to answer, but perhaps the best plan would be to petrify them and sell them for cigar-store signs. This idea is worthy of consideration.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

Chapter XIX.

Family 37. Melaniidæ, comprises several hundred species of *fresh water* shells, inhabiting all the warmer parts of the world excepting North America.

Family 38. Strepomatidæ, are also fresh water shells, about five hundred species, mostly confined to the United States, but not known to inhabit New England.

Family 39. Rissœllidæ, not represented in Rhode Island.

Family 40. Rissoidæ, contains an immense number of species, inhabiting all parts of the world, some genera in fresh water, and others in salt water, while some are amphibious. The animals are all herbivorous. This family is divided into seven sub-families, viz.:

Sub-Family 1. Bythininæ, two genera.
" " 2. Skeneinæ, one genus.
" " 3. Rissoininæ, four genera.
" " 4. Rissoinæ, three "
" " 5. Hydrobiinæ, fifteen "
" " 6. Lithoglyphinæ, six "
" " 7. Pomatiopsinæ, one genus.

Sub-Family 1. Bythininæ, not represented in America.

Sub-Family 2. Skeneinæ, contains one genus, Skenea; Fleming. Represented in New England by one species.

54. Skenea planorbis, Fabricus.

Shell minute, flat, discoidal, deeply umbilicated, showing all the whorls, three in number; apex slightly elevated; aperture round, dilated, in contact with, but not forming any part of the preceding whorl. Length, one-twentieth of an inch, breadth one-thirtieth. Habitat, on and under stones at low water mark, on rocky ocean shores, and among the roots of our common corallina. Dist., France and England, Norway, Spitzbergen, Iceland, Greenland, and Labrador to Long Island Sound.

Found in Rhode Island only at Watch Hill, so far as now known.

Sub-Family 3. Rissoininæ, not represented on our coasts.

Sub-Family, 4. Rissoinæ, not represented in Rhode Island.

Sub-Family 5. Hydrobiinæ, contains twelve genera, two of which, Littorinella and Amnicola are represented in Rhode Island.

Sub-Families 6 and 7. Lithoglyphinæ and Pomatiopsinæ are not found in Rhode Island, although one species of Pomatiopsis is found in the western parts of Massachusetts and Connecticut.

Genus littorinella, Braun.

Syns.:

Paludinella, Loven (not Pfr.). Littorinidea, Eyd and Soul.

Dist., World wide, in brackish or salt water.

55. Littorinella aculeus, Gould.

Syns.:

Cingula aculeus, Gld., DeKay.

Rissoa aculeus, Stimpson.

Shell minute, ovate-cylindrical, elongated, light yellowish horn color; whorls six, separated by a deep suture; apex obtuse; surface of the shell covered with regular microscopic revolving lines; aperture one-third the length of the shell, oval, oblique; lips simple, just touching the body whorl, leaving a small umbilicus. Length three-twentieths of an inch; breadth one-fifteenth. Found on stones at low water mark. It resembles the next species very much, but is distinguished by its habitat and by the revolving lines. Long Island Sound to Greenland. Common at New Haven, Conn. (Verrill). Gull Island (Smith). East Boston (Gld.). Watch Hill, R. I. (Verrill). Whole New England coast (Stimp.).

56. Littorinella minuta, Totten.

Syns.:

Turbo minutus, Totten.

Cingula minuta, Gould, DeKay.

Rissoa minuta, Gould, Stimp.

Shell minute, ovate-conic, elevated, yellowish-green, usually coated with a dark pigment or vegetable growth; whorls five, apex obtuse, suture distinct. Operculum horny. The shape of the shell and of the aperture, umbilicus and operculum is almost exactly like those of the preceding species, but the surface is destitute of revolving lines and the breadth of the shell is one-tenth of an inch (aculeus is one-fifteenth), while the length of the two species is the same, three-twentieths. It was described by Col. Joseph G. Totten in *Silliman's Journal*, VOL. XXVI., page 369.

Gould says of this species: "It is found plentifully on seaweed and on moist banks, about high water mark, especially on the thread-like plants which grow in ditches and brackish pools, in company with Littorina tenebrosa."

I have never been able to find *one* on seaweed, or in any situation where Littorina tenebrosa is found. I have found them on empty clam-shells between tides, and in shell sand thrown up above high water mark, about one-quarter grown, and have had just such looking specimens sent me from Massachusetts and Maine, but the best locality in Rhode Island is on the sand between tides, in water almost fresh and a little muddy. I collected at one time a great number of specimens of extraordinary size and perfection at Bishop's Bend, between Ingrahamville and Bucklin's Island on the Seekonk River.

57. LITTORINELLA EXARATA, STIMP.

This species I know nothing of, but include it here on the authority of Prof. A. E. Verrill, who obtained it at Watch Hill, among rocks and algæ in four or five fathoms water. He says it inhabits from Stonington, Conn., to Gulf of St. Lawrence.

GENUS AMNICOLA, GOULD AND HALD., 1841.

The fifty-seven species of Rhode Island shells which have been described in these papers thus far are all *marine*, or inhabitants of salt water. The species forming the genus Amnicola, however, are all *fluviatile* or fresh water species, not merely brackish, but confined entirely to ponds, fresh water rivers, etc. Amnicola is confined to the United States, and contains about ten species, two of which inhabit Rhode Island.

58. AMNICOLA LIMOSA, SAY.

Syns.:
Paludina limosa, Say.
Paludina porata, Ad. Philippi.
Amnicola porata, Gould, non Say.
Amnicola limosa, Binney, Hald., Perkins.

Shell small, conic-globose; smooth, usually covered with mud or slime, but under this coating, dark brown to light olive-green in color; whorls four, convex; suture deeply impressed; aperture nearly circular; lips sharp; inner lip just touches the body whorl, leaving a large and deep umbilicus. Length three-tenths of an inch; breadth one-fourth. Gould, in the *Invert. Mass.*, first edition, calls our shell the Amnicola porata of Say; later authorities pronounce it A. limosa, Say, and state that porata does not inhabit New England. W. G. Binney, in *Land and Fresh Water Shells of N. A.*, gives the only habitat of porata, Say, Cayuga Lake, Big Sioux River, and Moose Factory, B. A. In a letter to the writer, Mr. John G. Anthony said: "A. limosa, Say, is not positively known to conchologists, and I doubt the Rhode Island shells belonging to that species." I hope these remarks will bring out some opinions from other workers in this direction, as we have an abundance of the shells and would like to have its name settled. It is found in our rivers, ponds, brooks and ditches, adhering to submerged sticks and plants, but seems to prefer stones and the empty valves of Unios and Anodons.

59. AMNICOLA GRANA, SAY.

Syns.:
Paludina grana, Say.
Amnicola Brownii, H. F. Carpenter.

This species is found abundantly in Cunliff's Pond, at Elmville, three or four miles south of Providence, and in no other locality in Rhode Island, that I am aware of. I discovered them in 1870, and supposing them to be a new species, I named it as above, and read a description of it in a paper before the "Providence Franklin Society," Tuesday evening, March 26th, 1872, and published the same in the Central Falls *Weekly Visitor*, the next week. I have sent specimens of these shells to very many conchologists, and as they pronounce them to be Say's A. grana, my name is dropped. The following is my original description, which is not exactly like Say's in all respects, but it is correct: "Shell small, thin, translucent, of a light green color, when divested of the thick, dirty epidermis which covers it, turrited, elongate, composed of five gibbous whorls; operculated and umbilicated; apex very obtuse; suture very deep; aperture nearly circular, a little broader at the base; lips continuous, simple, the superior edge of the inner lip not touching the preceding whorl, except in young specimens. Average size one-tenth inch in length by one-fourteenth in breadth. Diameter of aperture one-twenty-fifth inch. Full grown specimens attain a length of three-twentieths inch."

(To be continued.)

A Hint to Conchologists.

THE following easy way of removing the smaller species of univalve mollusks from their shells without injuring the latter, may prove of interest to our conchological friends:

As the old saying goes, 'first get the shells,' then drop them into a pan of water close to the boiling point, and let them boil from one to two minutes, but no longer. Then, by inserting the point of a pin into the foot and turning the latter toward the inner lip or columella,— revolving the shell at the same time in an opposite direction,— the animal may be extracted without the slightest trouble. As soon as possible thereafter the shells should be carefully brushed, using a soft tooth-brush for the purpose, and those having an outward gloss well rubbed with a fine cloth or chamois skin, while those that are naturally dull, or covered with an epidermis, should be oiled lightly with the *purest* of *olive oil* only. Cotton-seed oil will make them offensive to the touch as well as to the sight. Unfortunately this boiling process will not answer for large specimens, as the amount of time required to sever their muscular attachments inevitably destroys the internal nacre, and therefore the value of the shells. It is pleasant to know, however, that the small and more delicate species can be so easily managed, saving, as the operation does, much valuable time to the student, and many a trial of his patience and temper as well. JOHN FORD.

PHILADELPHIA, PENN., June, 1885.

"WHAT nose is more brilliant than a wine bibber's? Volca-nos, to be sure. And the chief glow comes from the 'crater.'"

Mylacris Packardii.

THE above name has been lately given to an insect of the Carboniferous Age, by the great American authority, Professor Scudder, editor of *Science*, Cambridge, Mass. Its locality was Bristol, R. I., on the shores of Narragansett Bay, south of Peck's Rocks. The possessor, the Rev. Edgar F. Clark, gave it the temporary name of Blatta Americana. The canonical name given by Professor Scudder was in honor of Professor Packard, of Brown University, who also possesses large entomological reputation. The insect belongs to the cockroaches of geologic antiquity, of peculiar form.

Color of Birds Eyes.

California Barn Owl, nearly black.
Glossy Ibis, brown.
White-faced Glossy Ibis, red.
White Ibis, pearly blue.
Scarlet Ibis.
Roseate Spoonbill, carmine.
Wood Ibis, dark brown.
Great Blue Heron, pale yellow, straw.
Great White Heron, pale yellow, straw.
White Egret, pale yellow, straw.
Snowy Heron, pale yellow, straw.
Louisiana Egret, red.
Reddish Egret, red.
Little Blue Heron, yellow.
Green Heron, yellow.
Night Heron, red; young, brown.
Yellow-crowned Night Heron, orange.
American Bittern, light yellow.
Least Bittern, light yellow.
Florida Gallinule, red or brown.
Mallard Duck, brown, hazel.
Black Duck, brown.
Pin-tailed Duck, brown.
Gadwall, reddish brown.
Wigeon, brown.
Green-winged Teel, brown.
Blue-winged Teel, brown.
Cinnamon Teel, orange.
Shoveller Duck, orange-red.
Wood Duck, red.
Greater Scaup Duck, yellow.
Lesser Scaup Duck, yellow.
Red-head Duck, orange.
Canvas-back Duck, red.

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Lines

READ AT THE FIELD MEETING OF THE PROVIDENCE FRANKLIN SOCIETY, AT STIRLING, CONN., JUNE 6, 1885, BY PROF. W. WHITMAN BAILEY, OF BROWN UNIVERSITY.

PRAY who are all these "ists" and "ites"?
What mean these unaccustomed sights?
Who come with hammers and with boxes
To thus disturb the dens of foxes?
What cause for this uncouth attire,
Adopted both by dame and squire?
Are these State Farmers on a spree?
Or is this some society?
What do they here across the line,
Where wooden nutmegs grow from pine?
Methinks the average rustic may
Address himself in some such way,
And call us, of the desks and schools,
Perhaps, who knows? a set of fools,
To go rampaging o'er the stones,
At mortal risk to flesh and bones,
Just to "corral" some snake or lizard,
Or pop a blue jay through the gizzard.
There are more things in heaven and earth,
Horatio, than are given birth;
And 'tis by these that savants learn,
Who fossiliferous bowlders turn,
Or "yank the yarbs" up by the stem,
And clap long Latin names on them.
'Tis but a little that we know,
For all our most prodigious show.
Yet there are those, you know them well,
Assembled here, who from a shell
Or stone of some historic beach,
A sermon eloquent can preach;
Can, from a fern, produce the life
That once upon the earth was rife;
Or, from some meteoric dust
Create our planetary crust.
There are those, too, who'd stir your marrow
With tales suggested by an arrow,
A trifling bit of flint or glass
Which we more careless ones would pass.
If I interpret signs aright,
Our Chairman may, or surely might,
From his own note-book read a page
Of many a forest monarch's age;
For all of us, of course, agree,
He's most at home when "up a tree."
There is another of our band
Whom I could never understand,
Who calls him old? Just let him try
To walk him off his legs; not I.
Who knows, as he does, all the nooks?
The forest glens, the bubbling brooks?
The well where hangs the shiniest dipper?
The spot where blooms the lady slipper?
Where first you'll find the Epigæa
Or liverworts, each vernal year?
Where the shy orchis' spike is seen?
And where the ferns are earliest green?
Why! put him in the wood alone,
He'd find his way by lichened stone,
Or some mysterious sign, that we
Less favored mortals cannot see.
His voice is calm; his words are few
And simple, but we heed them too;
For ripe experience tells him then,
Just what to say, and where, and when.
But pardon me! I'm not to toast
Each member here; but two at most.
My jingling rhymes must now give way,
Let's hear what others have to say;
Let each one open up his box
And show his share of plant or rocks,
Or if his treasure's in his head,
We'll hear his learned talk instead.
Forgive the doggerel I have read.

A Rhode Island Clambake.

HISTORY OF THE CLAM FROM THE MUD TO THE TABLE.

A THOUSAND people—men, women, and children, old and young, rich and poor, of all sorts and conditions, seated in rows on stools at long, uncovered, white-painted deal tables, and engaged in the discussion of a clam dinner, is a sight without a parallel under the sun, is impossible to picture or describe, and must be participated in *in actu* to have any small realization of what it may be like.

The name of the man who first discovered that a Rhode Island clam was a delicacy is lost in oblivion. Let it remain so; the honor would be too great for any one name to support. But the clambake on the shores of Narragansett probably dates further back than the Williams' family cemetery. Old people yet living remember the days before excursion steamers, rival "resorts," and clambake clubs, when a day's trip "to the shore" was the proper thing, and the bake both the picnic meal and its main attraction. Clams are baked, to-day, too, as they were years ago, and no one wants them different.

Not only is the bake the same old bake with all its old fashioned flavor — a real antique in a world of would-be ancient andirons. blue china, and ancestry, but also is the clam the same old clam. Science distinguishes the Rhode Island long-necked clam from its low quality relation, the Coney Island quahaug, by terming it a *mya arenaria*. Few Rhode Islanders care about the distinction; they can tell a real clam with their eyes shut. A New Yorker may turn up his nose at the delicacy and chew on his quahaug, which must afford him about as much satisfaction as a piece of A. W. Faber's rubber. Rhode Island has clung to this dear old clam, despite all opposition and sneers — as she has to other as sacred and worthy institutions.

As at present served, a clam dinner prepared to fill, as it often is, from five to fifteen or twenty thousand people in the course of a few hours, is a stupendous affair, and from the bottom up is a work to be admired as a whole, and wondered at in its details; and few of the thousands who in the course of the summer season sit down to clam dinners, appreciate the work entailed in its preparation.

THE PIECE DE RESISTANCE.

First and foremost there is the clam. Most of the clams used at the shore resorts of Narragansett Bay come from the flats across the bay from Nayatt, on the Conimicut shore and on Green's Island. As far up as Pawtuxet and about Sabin's Point, the clams are considered hard, glue-shelled and gritty; but across at Bullock's Point they are good, and the Bullock's Pointers get their clams right at home. Two-thirds of the clams are got by "churning." The clam gang wades out over the bed and shovels up mud and clams and everything that comes along into big wire baskets, which, when about full, are lifted out of the water, and a rinsing and shaking washes out the mud and leaves the clams. Two men and a boy attend to each basket, one man shoveling in the mud, the second getting out the clams and the boy "culling" them. Churning can only be done at about half-tide, when the water is two or three feet deep. The suction on the shovel is tremendous, and they are made exceptionally strong. When there are good tides, on the full and change of the moon, the clams may be raked out after the manner of the non-professional digger; a shovelful of mud is turned up at a time and the clams it contains are raked out with the clam hoe. Consideration of either of the above methods is sufficient for a true understanding of the happiness of the clam at high water. The clam ordinarily lies in the mud from two to eighteen inches; a clam that would bury itself much deeper than eighteen inches is not to be looked upon with favor. It is a wearing-life that the clam diggers lead, working as they do in the water and so hard as to be constantly wet with perspiration.

At Rocky Point alone last year some 4,000 bushels of clams for the bake alone were used. The regular clam gang is seventeen or eighteen men, but on big days it is necessary to increase the force to fifty or sixty men. This year the clams on Green's Island are only one year old, and are ready for the bake — a remarkable case of clam growth. It appears that when the clams are in great abundance they grow very slowly, and those used last year from Green's Island were about three years old; but, being few of them "set" one year ago, they grew large enough for use very rapidly.

As the men are paid for their digging by the bushel it is evident that on skill and hard work depends the amount of money the digger gets, while "churning" is evidently more profitable than "raking." They get about eighty cents a bushel and every shore resort has its "thoroughbred" digger, who can get out more clams in a given time than any other man.

Well, once the clams are out of the water and in the boats they are towed to shore where they are piled in a shed, picked over, and carefully washed. Five or six men are employed constantly at this work at the larger resorts. The preparation of the pile on which the clams are to bake is the next step, and this is done on much the same plan everywhere: a pile of wood is laid, on every layer of which cobble stones are placed and the burning of the wood heats the stones and makes them ready to have the clams thrown on top. At Rocky Point, instead of building the pile on the ground, it is laid on a surface of stone, cemented with fire clay, and some such plan has been adopted in other places. This allows of the stones being pulled off after the wood is consumed and the plate swept clean of ashes; when the stones are piled on it again. Over the hot stones a mass of rockweed is piled, and the sight of a line of waiters with tubs of clams between them, running at breakneck speed for the pile, forming a circle about it, and emptying the tubs on top with a concerted effort, is familiar. Over the whole the canvas is laid, seaweed is heaped and a fragrant steam arises from the pile. Twenty minutes later the clams are ready for the table. And the accompanying dishes of clam-cakes, baked fish, fish chowder, lobster, green corn, brown-bread, and water melon. Between twenty-five and thirty waiters are required to serve all up in the larger dining-halls.

The shells are about the only things left after a well organized excursion party has attacked a clambake. These are carted off and dumped on some stretch of waste land. The accumulated shells of a season of some eighty days, is considerable. They lie in the sun until the following spring. Then they are spread over the roads, and prime roads they do make.

Said Capt. J. H. Northup, who has been the captain of the Rocky Point clam gang for some eleven years, "Do I expect the clams will get run out entirely? Well not just yet, and at present the prospect is something wonderful for next year. I never saw such a 'set' of clams as are all along the shore now; if they all lived, there would be enough clams to supply the world next year. Just come with me and take a look."

The tide was about half in, and the mud flats were scattered over with all sorts of refuse, shells and weed. The captain bent down and picked up what looked at first like a minute, broken-off bit of clam-shell, but, as it lay in his hand, a closer look revealed it a perfectly formed clam shell, a beautiful object, not as big as a baby's little finger nail, as white as alabaster, and the light showing pink through its delicate substance; the least pressure would have crushed it to almost invisible atoms. "That's a clam," said the captain, "that's maybe three weeks old, and you'll find millions about here. As quick as they get any size they will begin to burrow down into the mud. The whole shore is covered with them, and in all my experience of thirty years I never saw such a 'set.' They are so thick that the prospect is they will not grow fast, and it will take two or three years for them to get big enough to bake unless they die off. A handful of these will make more'n a bushel when they are grown up."

Pawtuxet has very aptly been termed "Clamtown," as that is the chief industry of the village, there being no less than sixteen firms and persons engaged as dealers, employing during the summer season from one to fifteen men each, making a total of seventy-five men engaged in the business. Besides furnishing the clams for several shore places, each of the fifteen employers deliver them in Providence by team, and several barrels are shipped each day to distant places. The total number of clams dug each day and delivered by the several dealers, average, during the present season, not less than one hundred and fifty bushels.

— *Providence Journal.*

One frosty morning, early in November, as I was watching a small flock of Yellow-rumped Warblers skipping and frolicking amongst the rustling plants in my garden, I noticed one very peculiar bird amongst them, and in a few moments had it in my hand. It resembled a very small Vireo, and a drop of blood on its beak, enlarging it, strengthened the illusion, so that I was confident that I had some new species of that family. But upon examination I recognized a rare old acquaintance, the Tennessee Warbler. I had never before seen one so late in the autumn.

J. N. Clark.

The Rocky Mountain Goat.

Aplocerus Montanus.

Of late we have had from Europe several calls for skins of this rare species. While we hope in time to be able to supply these specimens, the great difficulty of obtaining them should be appreciated.

The creature has a general resemblance to a goat, while the body is much like a sheep, but it is after all more nearly allied to the antelopes. It is rather larger than the average domestic sheep, and the very long hair, which is of a yellowish white color, coarse and brittle, falls down all over the body, tail, and upper part of the legs, and a beard or tuft of the same hangs from the chin; the horns, hoofs, and edges of the nostrils are black; the horns are much like those of the chamois,— smooth, conical, and turned slightly backward.

Under the long hair is a thick coat of silky white wool. An article by John Keast Lord, F. Z. S., in an old number of *The Student and Intellectual Observer*, published in London, gives a most interesting description of the animal, its habits, and the use which the Indians of British Columbia and Vancouver's Island made of this wool, using rude looms, and weaving blankets — often of good designs and colored patterns, sometimes mixed with feathers, but oftener with the silky hair of certain dogs, which they bred with great care for that purpose.

The highest levels of the Rocky Mountain and Cascade ranges are its almost inaccessible home, and there among the little stretches kept green by the melting of perpetual snow, where its food of grass, moss, and young fronds of *Pinus contorta* is to be found; the young, probably one at a time, are dropped in May or June, and are seen running with their mothers in July. From Professor Ward's *Natural Science Bulletin*, we copy the following:

"The Rocky Mountain Goat is one of the most difficult to procure of our North American mammals. Not only are the herds few in number, but they live high up in the mountains in the most inaccessible places, taking refuge — so say the hunters — where even a dog cannot follow them, and it sometimes happens that after a goat has been killed the body cannot be reached, or else falls from a cliff, and is so mangled as to be useless. Even after specimens have been secured and 'backed' to camp, the trouble is by no means ended, for in order to get them to the nearest station it is necessary to transport them over rough and rocky mountain passes and across swollen and turbulent rivers, at imminent risk of loss. Specimens received have been on the road for over four months. The following are extracts of letters from two of our (Professor Ward's) correspondents in the region where the mountain goat is found:

"'The Mountain Goat is very scarce —, only found in a few places. They range very high up among the rocks and cliffs. They do not seem to be a shy animal, but after killing one it is extremely difficult to get it out. I have on two occasions killed a goat, and could not possibly get to the animal.

"'Could you see, or I describe to you, the configuration of the mountain chasms and peaks where the Indians procure the animals in question, you would understand what a task it is to procure a specimen that is not mangled, torn, and utterly ruined (except for food), by a fall of perhaps thousands of feet into some gloomy abyss, when the shot is fired that kills. In this connection I may be allowed to mention that last autumn, the Indians while bringing me a carcass of a goat, a distance of eight miles to reach my ranch (at the foot of the main range), lost horse and carcass over a precipice, so that to avoid trouble with the Indians, I purchased horse as well as goat.'"

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XII.

2. *Hyla pickeringii* Le Conte. (*Hylodes pickeringii* Holbrook.) The Piping Tree Frog, or March Peeper is one of our most abundant *Batrachians*, myriads being heard at certain seasons of the year, though, due to their small size and unobstrusive ways, they are seldom met with by the more casual or indifferent person. When searched for, however, they are, especially during the months of spring, found in large numbers, usually about the dead grass or dry leaves bordering some warm shallow pool, or inundated field.

The amateur, bent on seeing a March Peeper, quietly steals towards the pool where hundreds are calling, but is surprised to find that long before he reaches the orchestra all music has ceased. This timidity on the part of the musicians is very remarkable. A passing bird, or even a shadow will often produce immediate silence. The Peeper is a restless fellow, however, and soon to the attentive eye, a slight disturbance betrays his whereabouts, as he endeavors to crawl out on some floating leaf or half submerged mass of straw, before he inflates himself for work.

The method of calling is interesting. Having drawn in a long breath, the male (the females are dumb), by means of two slits, each near the angle of the jaw, inflates a loose sac, lying below the transverse muscles of the floor of the mouth, and thus retains it until a sufficient number of "peeps" have been given to exhaust the supply of air, or until disturbed, when the sac immediately disappears. Before thus peeping it has been observed that the frog invariably crawls from the water to some slightly elevated spot.

By the middle of May or the first of June the breeding season is over with, and the exhausted animals retire to the neighboring woods and gardens to live in silence for a few weeks, but they are soon heard again during the sultry days of August, now, not from the meadows, but from the trees of the uplands. At this season, however, they are less noisy, and their numbers being scattered, they attract but little attention. As they are, with the wood-frog, the first of the *Batrachians* to appear in spring, so they are the last to retire in the fall, and even in midwinter a few warm days are sufficient to encourage their musical powers. While hibernating they are known to remain under dead leaves.

Many interesting facts in connection with this animal have been published by Mary H. Hinckley. The eggs, which differ from those of our other frogs in that they are laid singly instead of in strings or groups, in from seven to twelve days after their deposition, give rise to tadpoles.

When in the water these unfortunate animals are preyed upon by many enemies, of which newts, larger frogs, the larvæ of insects, birds and smaller mammals are the most destructive. A spider, *Dolomedes sexpunctatus*, was observed to walk out on the surface of the water, and dive and secure the helpless tadpoles as if to make of them a regular diet. Long before their tails have become absorbed, to escape the war of extermination waged against them, these miniature frogs climb up on the stalks of grass or on floating leaves and there, out of dangers way, await the approach of some unsuspecting mosquito or small fly.

The extreme small size, pale reddish brown color, sucker-like toes and the cruciform ornamentation of the back prevent this species from being confounded with any other.

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. V.

Quercus rubra — RED OAK.

IN the previous numbers of this series, the annual-fruited oaks of the state have been treated. In this article, and several subsequent ones, the biennial-fruited group will receive attention. It should be here recalled, that the chief point of separation into these groups is, that of the time required from the blossoming to the ripening of the fruit,—the first perfecting it the first season; the second, in the autumn of the second year. In the "biennials," the acorns appear hardly larger than a pin's head during the first season, the new growth of the branches shooting out beyond them, so that in the second season, when they begin to grow, they seem to come directly from the branchlets, without the usual preparation of blossoms.

Another noticeable distinction is, that the "annuals" have leaves with lobes or teeth rounded or blunt at their extremities, while the lobes of the "biennials" are all terminated by sharp bristly points. The wood of the "annuals" is, as a group, much better for most purposes of timber than that of the "biennials."

The *Quercus rubra*, red oak, gives name, from its abundance and prominent characteristics to the group the "red oaks." *Q. rubra* is not very abundant in Rhode Island; still, there are scattered trees by the cool banks of the streams, and in the northern part of the state, among the hills, they are occasionally seen in groups. In central New England, and especially in Massachusetts, they reach their perfection of growth and beauty. In Providence some fine specimens of forest red oaks may be seen near the Blackstone Park brook; and a well-grown tree, of remarkable beauty and symmetry, is now standing upon the steep, sloping bank of the river, just below the Merino mill.

The tree, in full development, forms a magnificent rounded head, with a massive trunk and numerous smooth, clean-looking limbs, usually striking out from the trunk and each other in sharp angles. The bark is notably smooth, even up the main stem, until the tree is twenty-five, or more, years old. The color is generally greenish gray, varying with age and location. It becomes furrowed upon old trees, but is less rough than that of most oaks.

The foliage varies greatly upon different trees, but the characteristic leaf is oblong, wider towards the end and narrowed at the base. There are five or six sinuses on each side, rounded, but not deeply cut, giving rise to as many lobes, each terminated by a bristly point.

The fruit need not be mistaken. It is the largest of that of any native oak. It is placed in a wide, shallow cup covering very little of the acorn. The acorn is extremely bitter, but is readily eaten by swine.

The wood is so porous and brittle as to be of little value for most timber work. It is extremely difficult to dry out the sap of the wood; hence, the woodmen say that it will never season. But for chair work, especially for artificial steam-bending, it is in high repute, and for that purpose and for barrel staves, the forests are being culled of this tree.

It is a tree of very rapid growth and well adapted for a shade tree. The leaves are of a bright, shining green all summer, and change to fine tinges of red in the autumn. It is always a clean, healthful-looking tree, and rarely harbors disagreeable insects. It is a difficult tree to transplant, as are most nut-bearing trees, and for resetting the trees should be started in a nursery, and there treated to tap-root pruning.

The tree varies so much in Rhode Island as to give rise to at least two marked varieties besides the typical red oak; one growing sparingly upon the banks of the Seekonk River, perhaps elsewhere, having very long, lance-like leaves, usually somewhat one-sided, often with a crooked midrib; another variety grows quite plentifully upon the borders of the Pawcatuck River and other portions of the southern part of the state. This has much smaller acorns than the typical ones and in a deeper cup, and the leaves are correspondingly small. I have also seen specimens of this variety near the Diamond Hill station.

It may be added that the range of this oak is very great, growing farther north than any other oak, even to near the Hudson Bay, and upon the slopes of the Alleghanies as far south as they extend. It will also flourish upon all kinds of soil, from a swamp to the crevices of the rocks high up the mountain sides, where it forms itself into burls and low impenetrable heads yards wide but not a foot high, the last of the deciduous trees to defy the blasts.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XX.

FAMILY 41. Assiminiidæ, contains one genus, Assiminea, Leach, one species of which inhabits Rhode Island.

60. ASSIMINEA MODESTA, H. C. LEA.

Syns:

Assiminea Grayana, Verrill, non Leach.
Cingula modesta, Lea.

Shell small, conical, imperforate, smooth, thin, glossy, light chestnut brown, tinged with greenish or grayish from the seaweeds on which it lives; whorls five or six with an acute tapering spire; last whorl large, round. Length, one-eighth inch; breadth, one-twelfth.

This species was found by H. C. Lea, on the under surface of stones near Brooklyn, L. I., and described by him in *Proc. Bost. Soc. Nat. Hist.*, I., 205, 1845, under the name of Cingula modesta. It has since been found at Huntington, L. I., between tides. In 1880 Prof. A. E. Verrill discovered a shell at Newport, R. I., at high water mark, on decaying seaweeds, between the docks, together with Alexia myosotis, and Truncatella truncatula. He supposed it to be the European shell Assiminea Grayana, Leach, introduced to this port by shipping, and so described it in his *Cat. Mar. Moll.*, 1882. Since then he has compared these Newport specimens with the English ones, and has become satisfied not only that they are unlike, but that they are the same as Lea's modesta, and in the second *Cat. Moll.*, 1884, he gives a full description of the shell, with extended remarks on the same, calling it Assiminea modesta, (Lea) Verrill.

FAMILY 42. Valvatidæ, contains one genus, Valvata, Müller, inhabiting ponds and ditches and sluggish streams. There are three sub-genera, two of which are found in New England, each represented by a single species.

61. VALVATA (TROPIDINA) TRICARINATA, SAY.

Syns.:

Cyclostoma tricarinata, Say, 1817.
Valvata tricarinata, Say, Desh, Menke, Hald., Gld., DeKay, Adams.
Valvata carinata, Sowb.
Valvata bicarinata, Lea.
Valvata unicarinata, DeKay.
Tropidina tricarinata, Chenu.

Shell small, depressed, thin, nearly transparent, of a greenish color; whorls three to four, flattened at the apex, and separated by a canaliculate suture; the whorls are encircled by three keels; umbilicus broad, deep, and funnel shaped; aperture circular, lip simple; breadth one-fifth inch.

This is a very curious species, and is subject to much variation in form, and in the number of carina. The bicarinata of Lea, having two keels, and the unicarinata of DeKay, having but one, are referred to this species. Professor Adams found in Vermont specimens perfectly simple and round, having no carina, to which he gave the name of var simplex. Specimens are found having all degrees of carination, showing them all to be the same species. Say found his specimens in the Delaware River and afterward in the Missouri; DeKay in Lake Champlain and in the Erie Canal; Lea in the Schuylkill; Adams in Vermont; Perkins says, 1870: "It is common in all the ponds and streams around New Haven, Conn." It has not been observed in Rhode Island, but may yet be found here, as it has a very extended range.

Haldeman says of this species: "The ova are deposited from the first day of March to the end of July, in transparent masses, one-twentieth of an inch in diameter, each containing a number of germs of a bright green color, dotted with yellow.

62. VALVATA (LYOGYRUS) PUPOIDEA, GOULD.

Shell small, imperforate, elongated-oval, opaque, chestnut-colored when divested of the rough, dirty pigment which usually covers it; whorls four to five, minutely wrinkled; apex obtuse; the body whorl disjoined from the preceding one; aperture circular; lip simple, not touching the body whorl; operculum horny, concentric, apex central. Length one-tenth inch, breadth three-fortieths.

This shell was described in *Silliman's Journal*, VOL. XXXVIII., page 196, 1840, by Dr. A. A. Gould. It was first found at Fresh Pond, Cambridge, Mass., on stones and submerged sticks, and since then in Canada, Maine, and Connecticut. On this account I include it among Rhode Island shells, as it has not yet been found here, and I have never seen the shell, and know it only by the description and figure in Gould's *Invert. Mass.*

FAMILY 43. Paludinidæ, contains three genera of fresh water shells, which are conical or globular in shape, with a thick olive-green epidermis. Two of these genera are represented in the United States, and one, Paludina, Lam., in Rhode Island. The genus Paludina contains about one hundred species, divided among seven sub-genera, three of which inhabit our country, viz.: Paludina (restricted) or Vivipara, Melantho, and Tulotoma. Our shell is the

63. PALUDINA (MELANTHO) DECISA, SAY.

It would be useless here to give the very extended synonymy of this species. Mr. Binney, in his *Fresh Water Shells of North America*, gives the names of twenty synonyms of this shell, five of which are certainly distinct species. Our shell was described under the name of Lymnæa decisa, by Thomas Say, in 1817, in *Nicholson's Ency.* In 1819 he changed the name to Paludina decisa. This name was adopted by Gould, Haldeman, Adams, DeKay, Kuster, Reeve, Binney, and others. In 1862 Mr. Wm. G. Binney applied the name of Melantho decisa to it, which name it has retained.

So many descriptions have been given by various authors to shells referred to this species, that I can do no better than to quote the original description by Say: "Shell sub-conic, olivaceous, truncated at the apex; whorls four, wrinkled across, entire; within bluish white; operculum coriaceous, elevated on the disc, and concentrically striated. Length one inch, breadth three-quarters." It is found in ponds and muddy streams. Several years ago, when the water of the Blackstone River was drawn off at Pawtucket, I examined the bed of the river, just above the upper dam, and among several other species, was an abundance of these shells buried in the mud, where, under ordinary circumstances, their existence would not be suspected, or if so, they could not be obtained, being under several feet of water. Sometimes they are found under shelving banks or in mud near the margins of large ponds. They are stout and solid shells, varying in color from yellowish-green to dark olive. Our Rhode Island shells have a uniform dark olive green epidermis, and the apex is invariably decollated. At Albany, N. Y., where Melantho decisa and integra live together in the Hudson River, this species is always decollated, while the apex of integra is perfect. They do not deposit ova like the other fresh water snails, but retain the young within the shell, and when they make their advent into the world they are provided with a shell of three complete whorls.

All the shells thus far described in these papers are marine or salt water species, excepting five species which are fresh water shells. These five are *water breathers* and live at the *bottom* of our ponds and rivers, and are not obliged to come to the surface to obtain a supply of air. They are also provided with an operculum, or door, with which they close the mouth of the shell. It is attached to the foot of the animal, and when the animal retires into its shell, the operculum is the last portion to go in and completely closes the aperture. This operculum is not composed of carbonate of lime like the shells of mollusks, but of phosphate of lime and animal matter, like the shells of crabs and lobsters, and much resembles horn. There are also very many other fresh water snails, which breathe *air* and are *not* furnished with an operculum. These belong to a different sub-class from those heretofore described and from many others to follow, but will be taken up in their order at a future time.

(To be continued.)

CHECK-LIST OF BRITISH FRESH-WATER SHELLS.

J. RITCHIE, JR.

Paludina contecta Millet.
vivipara Linn.
Bythinia leachii Sheppard.
tentaculata Linn.
Hydrobia similis Drap.
ulvæ Penn.
ventrosa Montagu.
Valvata cristata Müller.
piscinalis Müller.
Neritina fluviatilis Linn.
Limnæa auricularia Linn.
glabra Müller.
glutinosa Müller.
involuta Thompson.
palustris Müller.
peregra Müller.
stagnalis Linn.
truncatula Müller.
Physa fontinalis Linn.
hypnorum Linn.
Planorbis albus Müller.
carinatus Müller.
complanatus Linn.
contortus Linn.
corneus Linn.
Planorbis dilatatus Gould.
glaber Jeffreys.
lineatus Walker.
nautileus Linn.
nitidus Müller.
spirorbis Linn.
vortex Linn.
Ancylus fluviatilis Müller.
lacustris Linn.

Sphærium corneum Linn.
lacustre Drap.
ovale Fer.
rivicola Leach.
Psidium amnicum Müller.
fontinale Drap.
nitidum Jenyns.
pusillum Gmelin.
roseum Scholtz.
Unio margaritifer Linn.
pictorum Linn.
tumidus Retz.
Anodonta anatina Linn.
cygnea Linn.
Dreissena polymorpha Pallas.

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Mammal Skins.

Remove the skins with the least possible delay, particularly in warm weather, and from the smaller specimens. Make a straight cut from the breast, between the fore legs, along the belly, to the vent. Be careful not to cut through into the cavity and intestines, and do not at any time stretch the skin. Cut off the legs close to the body, so as to leave all the bones in them. Push them carefully out of the skin, down to the claws, or as far as can possibly be done, without cutting it entirely free. Clean all the meat thoroughly from the bones, if the specimen is to be made up dry. Cover them and the skin with Arsenic Preservative, or Arsenical soap, wind a very little cotton or tow around them, to prevent their contact with the skin, and turn them back. Then withdraw the bones from the tail; this can be done by the nails of the finger and thumb of the left hand, or two flat slender pieces of wood held firmly at the root of the tail, or place around it the small opening that occurs in a pair of scissors, just back of the blades and forward of the finger holes, then with the right hand pull the bones steadily, and they will come out of the skin. Now turn the whole skin backward, (inside out) until the junction of the ears and skull is reached; use particular pains in separating these and the eyes from the skull. If the lids of the eyes are cut they will often tear further and make a conspicuous damage. Cut the ears off close to the skull; carelessness in this respect leaves a large and unsightly hole where the ear opens through the skin. On large specimens it is well to skin the ears as far as possible, and thoroughly poison the whole, putting back the cartilege. Proceed to the mouth, and cut the lips off close to the gums. In the thick lips and eyelids of large animals, pass the knife between the inner and outer skin, and see that the preservative is well introduced there.

Clean the whole skin thoroughly, from fat and flesh, (the specimen will soon become next to worthless unless this is done), poison every part thoroughly. It is a good plan to puncture the tip of the tail. In the larger specimens with long fur, like foxes and wolves, raccoons, etc., it insures the introduction of the poison the whole length, and admits to air for uqick drying.

The lips are now caught lightly together by two or three stitches on the inside, the skin turned back, and filled lightly with cotton or tow, to its proper shape, and the opening stitched lightly together. It is well to introduce a wire or small stick into the tail when it is small and slender, as with mice, rats, etc. Long and large tails should be brought forward between the legs, or turned over the back; the legs should be brought snugly together under the body, and the whole specimen thoroughly dried, not in the sun or by a fire. Do not leave skins turned wrong side out; do not leave them to dry twisted out of shape, and the legs pointing in every direction. A well made skin of a small mammal is as pretty as that of a bird, and will sell better and mount better than the offensive looking specimens commonly seen. Clean the skull thoroughly, poison it, and mark it distinctly on a label to correspond with the number of the skin, or fasten it securely to the hind legs of the specimen.

On account of the space they occupy, and cost of transportation, large skins should be filled out but very little, or not at all, and after drying can be folded as snugly as possible.

In curing skins use always, when it is to be obtained, arsenical soap or a mixture of powdered alum and arsenic, in proportions of six and four parts by weight respectively. An application of spirits of turpentine to the nose, ears, feet, or any spot that seems tender and likely to shed its hair, is very beneficial.

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. VI.

Quercus tinctoria — Black Oak.

Q. tinctoria, commonly known as the black oak, is the most abundant member of the biennial oaks in Rhode Island. It still occupies, for all the ruinous tree-cutting of our people, numerous areas of many acres each, almost to the exclusion of other trees. On the plains of Providence, and below along the bay, it has notably had possession of the ground. With many well-preserved groups still standing, there are scores of single specimens now growing, which from their symmetry and beauty, and in some instances their massive proportions, appeal alluringly to lovers of trees. A few of these will be mentioned later.

The general appearance of this tree in its full development, which is nowhere finer than in this state, is that of a widely expanded orbicular mound of well-balanced limbs, supporting a dense foliage of shining green. This, in open ground, supported by a short sturdy trunk.

On approaching these trees we find the bark black, thick, deeply furrowed, and transversely broken, so as to make irregular oblong pieces, firmly united underneath. The inner surface is yellowish in color and excessively bitter, which quality extends to that of the smallest branches. The young branchlets are brownish, tinted with red or green, and somewhat furrowed. Before the recent discoveries in dyeing materials, the inner bark was much used for coloring, giving, primarily, shades of yellow, but, mixed with other, a variety of beautiful colors. It was largely shipped from Philadelphia.

The fertile blossoms come from the axils of the leaves, and like those of all the biennial oaks, do not develop their fruit until the second year. The staminate flowers are long, pendent catkins, forming a pretty appearance, as they do upon the oaks generally.

The acorns are flattish at the base, about one-half an inch long, usually finely striped from base to apex with alternate bands of dark and lighter brown. The meat of the acorn is yellowish and very bitter, like the bark. The acorn is set in a deep cup, made up of scales with recurved tips: The fruit is very abundant, and it would seem should serve some good purpose besides that of propagating its species, and of feeding wild animals. The leaves are the glory of the tree. They are on long, slender footstalks, deeply cut, sometimes almost to the mid-rib, by rounded sinuses, showing three pairs of lobes and a terminal on each, ending with a bristly point. They are a lively green covered with a natural varnish which heightens their beauty of form. In the autumn the leaves turn into shades of orange and yellow, often slightly tinted with red.

The wood is probably the best, as timber or fuel, of any of the biennial oaks. It should, however, be fastened, in work where durability is important, with wooden pins, as it decays readily around iron nails.

One of the grandest specimens of this tree in the state is now standing in the rear of the barn in Roger Williams Park. It is upon a sloping bank bordering the swampy ground which its roots probably reach. This tree is about twelve feet in circumference near the ground, and seventy feet high. Its age must be very great, but it is still vigorous. In the vicinity of the Broad Street entrance to the Park, both within and outside its limits, are some finely developed trees of this kind. Indeed, the Park owes much of its sylvan attractiveness to the numerous trees of this species occupying the dryer wooded portions.

It is rare to find this tree further north than the southern part of Maine and New Hampshire, but it is common in the middle Atlantic states, and its range extends far to the south and west. Is is notably variable, running into some other species by almost insensible gradations.

As a substitute for the white, mealy appearance seen around the eyes of birds, the following is recommended: "In a coffee-pot of water put scraps of slightly sized white paper, boil six hours; take out and squeeze through a colander, pound in a mortar to a fine paste, dry well and pound again to a fine powder."

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XIII.

WE now come to the frogs proper, of which there are in this state five species, all included in the single genus *Rana*. The frogs differ from the tree-toads by having their toes unprovided with viscous disks and in being aquatic and terrestrial; they are at once distinguished from the toads in that the upper jaw is provided with teeth, and they are separated from the Scaphiopidæ in being unprovided with the spur so characteristic of that family.

1. *Rana sylvatica* Le Conte. The Wood Frog is one of our most abundant Batrachians, as it is one of the most beautiful and interesting. Often the writer has been told of a peculiar looking frog that was seen in some grove, hopping about on the fallen leaves and, though away from water, seemingly perfectly at home. To the query: Had it a black patch on each side of the head? the answer has always been "yes." This very dark brown patch is characteristic, and though specimens be captured, ranging in length from one to four inches, all will be found to bear this badge.

Though most abundant in the dry oak groves, the wood frog is not unfrequently met with in open meadows and about brooks and other small bodies of water. In the latter situations it is to be found early in March, as it is one of the first frogs to awake from winter sleep and begin domestic duties. It is probable that the eggs are well matured before hibernation begins. To pass this period, a warm slope is selected where there is an abundance of fallen leaves, into which the reluctant animal, often not until driven to it by snow, works a small burrow and awaits the return of warm weather.

In its coloring this species is very variable and is an interesting form on which to note the changes, so characteristic of the members of this class. Not only does a single individual often change its hue in a few minutes of time, but the hues are limited, to a greater or less extent, by the season of the year. In the spring often the play of shades is limited to the dark browns and blacks, though as the season advances, lighter shades are adopted, specimens of a light flesh-color being not infrequently met with in mid-summer. It is a mistake to maintain that this change of color is influenced by surroundings, as the change often goes on while the surroundings remain the same. It may be true, however, that the animal not infrequently takes advantage of this power, and thus renders its efforts at concealment more effective.

In its geographical range *R. sylvatica* is found along the valley of the St. Lawrence as far west as Wisconsin, and along the Atlantic slope to Virginia. The Western Wood Frog, a variety of the present, extends the habitat to the Pacific Ocean.

Color of Birds Eyes.

Golden-eye Duck, golden yellow.
Barrow's golden-eye, golden yellow.
Butter-ball, } brown.
Buffle-head, }
Long-tailed Duck, } brown.
Old-squaw, }
Harlequin Duck, reddish brown.
Stellar's Eider, brown.
American Eider,
Pacific Eider,
King Eider,
American Black Scoter, brown.
Velvet Scoter, yellow.
Surf Duck, pale yellow.
Ruddy Duck, reddish brown.
Merganser, carmine.
Red-breasted Merganser, carmine.
Hooded Merganser, yellow.
Common Gannet, white, cream.
Brown Gannet, white.
White Pelican, pearly white.
White Pelican, young, brown or dusky.
Brown Pelican, white.
Common Cormorant, green.
Double-crested Cormorant, green.
Florida Cormorant,
Violet-green Cormorant,
Snake Bird, carmine.
American Swan, hazel.
Common Puffin, brown.
Sea-dove, or Dovekie, brown.
Tufted Puffin, brownish yellow.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXI.

FAMILY 44. Ampullariidæ, large globular shells, living in fresh water lakes and rivers, retiring into the mud during the dry season.

The species are more than one hundred and fifty, divided among four genera, and four sub-genera, all inhabitants of tropical or semi-tropical parts of the world. A few species are represented in the southern parts of the United States.

FAMILY 45. Truncatellidæ. Animal amphibious, inhabiting margins of streams, salt marshes, etc. There are six genera, four sub-genera, and about one hundred or more species.

GENUS TRUNCATELLA, RISSO.

Of the six genera comprising the Truncatellidæ, this genus alone is represented in America. It is called the looping snail. It progresses by contracting the space between the foot and the lips like the geometric caterpillar. The type of the genus is the Truncatella truncatula, Drap., which also happens to be the one which inhabits Rhode Island. There are sixty-two species of this genus.

64. TRUNCATELLA TRUNCATULA, DRAP.

I have never seen a description of this species; have never seen a specimen of the shell; have never heard of its being found anywhere in the United States excepting at Newport, R. I., and all I know about it is the following quotation from A. E. Verrill's *Cat. Mar. Moll.*, p. 525, 1882:

"This species was found by the writer, living in considerable numbers, and of all ages, among the docks of Newport, R. I., July, 1880. It occurred among decaying seaweeds thrown up at high-water mark, both among the vegetable matter and on the under side of stones.

"Common on the coasts of Europe in similar localities. Perhaps introduced on this coast by shipping, but it may have been hitherto overlooked. It was associated with Assiminea Grayana and Alexia myosotis."

FAMILY 46. Cyclostomidæ. This is an immense family of operculated *land* shells, breathing air. It is divided into five sub-families, thirty-two genera, fifty sub-genera, and contains over twelve hundred species, not one of which inhabits New England. There is one species only in the United States, which inhabits Key West, Florida, but hundreds of species of these beautiful terrestrial mollusks cover the numerous islands of the West Indies.

FAMILY 47. Helicinidæ. This is also a large family of operculated land shells. It consists of nine genera, seventeen sub-genera, and over five hundred species, mostly confined to the West Indies. Four species inhabit the United States, one in Texas, one at Fort Dallas and Key Biscayne, Florida, one near New Orleans, and one from Texas to Georgia, and from Tennessee to Florida. None are found farther north.

It was stated in Chapter V., RANDOM NOTES, Vol. I., p. 9, 1884, that the sub-class Prosobranchiata is divided into four orders, viz.: Pectinibranchiata, Scutibranchiata, Polyplacophora, and Nucleobranchiata. We have now given descriptions of all the Rhode Island shells belonging to the first order of the sub-class Prosobranchiata. There is but little difference in the animals of the second order from those of the first; in fact, the description given in Chapter V., of Pectinibranchiata will very closely apply to the Scutibranchiata. The very latest authority recommends the suppression of this order and its sub-orders entirely, and the merging of its members in the previously described Pectinibranchiata. I shall therefore depart from the arrangement originally intended (in regard to this sub-class only), and drop the name of Scutibranchiata, and proceed to enumerate its families and genera as though a continuation of the Pectinibranchiata.

FAMILY 48. Neritidæ: four genera, seventeen sub-genera, and over three hundred and seventy species, all foreign to our fauna.

FAMILY 49. Liotiidæ: two genera, nine sub-genera, and twenty-five species; also foreign.

FAMILY 50. Rotellidæ: two recent and eight fossil genera, with twenty-eight recent species, all foreign.

Family 51. Phasianellidæ: three genera, three sub-genera, and twenty-eight species, all foreign.

Family 52. Turbinidæ; two recent genera, eighteen sub-genera, and about one hundred and thirty species, all foreign.

Family 53. Trochidæ. This immense family contains over three hundred species, distributed among four genera and fifty-six sub-genera. Only one of these genera, Margarita, Leach, is represented on the Atlantic coast of the United States. The species of this genus are deep water in their distribution and are mostly obtained from the stomachs of fishes. They are also boreal and inhabit the cold waters of the Arctic and Antarctic poles. Of the nine species of this genus which are credited to the New England coast, but two might possibly be found in our waters. They never have been found here to my knowledge, but we will give them the benefit of the doubt.

65. **Margarita helicina, Fabricus.**

Syns.:

Turbo helicina, Fabricus.
Turbo inflatus, Totten.
Paludina inflata, Menke.
Margarita arctica, Leach, Sly., DeKay, Gld.
Margarita helicoides, Beck.
Margarita helicina, Stimp. and modern authors.

Shell orbicular, depressed, thin, smooth and shining, of a bronze metallic tint and iridescent; whorls five, convex, the body whorl large with fine revolving lines on the base; suture well impressed; aperture round, expanded; lip sharp; umbilicus large and deep; operculum multispiral. Length one-fifth of an inch, breadth three tenths. Their habitat is on leaves of Laminaria in deep water, and are sometimes thrown up on ocean shores during a storm. They are found as far north as Greenland and in Baffin's Bay.

66. **Margarita obscura, Couthouy.**

Shell conical, depressed, solid; spire dull reddish-brown; base ashy; whorls five, convex, angulated in the middle by from one to three revolving ridges, and covered with numerous fine lines, those at the base almost microscopic; aperture round, pearly within; lip sharp; umbilicus large and deep, bounded by a sharp angular ridge; operculum horny, multispiral. Length one-half inch, breadth seven-twentieths. It is a beautiful little species, the surface being of a brilliant silvery lustre with crimson reflections, after the exterior epidermis is removed. It is found in the stomachs of fishes caught off Nahant, Mass., and Stonington, Conn. "Common in Massachusetts Bay, Casco Bay, and Bay of Fundy, from low water to 100 fathoms." (Verrill.)

Family 54. Stomatellidæ, all foreign.

Family 55. Pleurotomariidæ, all foreign.

Family 56. Bellerophontidæ. This family comprises a very large group of Palæozoic fossils. I believe there is not a single species of recent or living mollusca belonging to it.

Family 57. Maclureidæ, contains twelve species of fossils belonging to the genus Maclurea, Lesueur.

Family 58. Haliotidæ, one genus, four sub-genera, and seventy-five species, all foreign.

Family 59. Fissurellidæ, six genera, and nearly two hundred species, all foreign.

(To be continued.)

Gift to Brown University.

Miss Anna A. Stout, of New York, announces her intention of bestowing upon Brown University the valuable herbarium of her brother, the late William Stout. The collection is especially rich in ferns, and is accompanied by a fern library of about twenty volumes. Miss Stout has already mounted over 1,800 sheets of ferns alone, and estimates that from 800 to 1,000 more will be needed. Probably Dr. Garber's Florida phænogams will require 350 more, and the Atkinson collection of Northern Himalayan ferns 560 to 570 sheets. Besides these there are many valuable duplicates of well-known collections, available for exchange. What is now sorely needed is a fund for the endowment of the botanical chair. A daily struggle for bread and butter is scarcely compatible with the best results either of teaching or research.

When you are drowsy from reading or work, sleep until you are rested. Nature, by feelings of fatigue, calls for rest.

Phryganea.

The old English word Cadas means a case for security. The word still lingers in tea-caddy. The case-worm or larva of *Phryganea* is a soft-bodied creature, but it has a firm head and strong jaws. It is supplied with six legs, well adapted for locomotion, and with two hooks at the end of the tail by which it secures itself in its case. It is a rapacious and pugnacious insect. It feeds upon fresh-water mollusks, larvæ, polyps, etc. As a builder it makes use of the materials at hand. The old Free Masons may have taken a lesson from it, and Longfellow might have had it in mind when he sang,—

> "That is best which lieth nearest,
> Shape from that thy work of art."

Sometimes the case is made of sticks, sometimes of grains of sand, and, in Great Britain, sometimes of the shells of the small river-snail (Planorbis), even while their proper owners have them in occupation. The cases not only serve for protection but for anchorage also, and they are found to be the heaviest where the current is strongest — the creature having added materials to increase the weight.

If the caddis be deprived of his case, it will at once set to work to construct another; and, in confinement, it will build of materials supplied to it, such as small fragments of glass and coral and the broken teeth of combs. However rough the outside of the case may be, the inside is perfectly smooth, for it is lined with the same cement which binds the materials together, and which is exuded from the mouth of the creature.

It is interesting to watch the caddis shifting his ground, moving his habitation from one part of the river-bed to another. So much of the body as will allow the legs free motion is protruded, and the creature strains like a horse with a heavy load, whilst its dwelling moves forward more or less steadily accordingly as it presents a smooth or roughened surface.

Before the *pupa* change takes place the caddis draws itself entirely into its snug quarters, and spins a strong netted covering over the entrance to the case. Having thus "barred the door" against intrusion, it dozes off into the long sleep, the waking from which shall be an introduction to a new life, in another element.

The Phryganidæ in their perfect state differ from others of the Neuroptera, in that they are covered with minute hairs. Hence Westwood and other English naturalists have classed them as a separate order, the Trichoptera (Gr. *θριξ*, hair; πτερον, a wing) or hairy-winged insects.

In dress the Phryganidæ are a sober people — browns, drabs and yellows are their favorite colors. Cross-venations give their wings a netted appearance. Their antennæ are long — in some instances very long, and the wings are carried longitudinally. The females deposit their egg-masses early in August on some surface projecting from the flood. Woodward tells us (*Int. to Mod. Class. of Ins.*, *Vol. II.*, *page 62*) that occasionally they descend the stems of water-plants and lay them under water. The egg-mass resembles miniature frog-spawn. It is an accumulation of drops of gluten containing embryons in the form of minute green specks. The young larvæ burst forth in September, and proceed at once to construct their dwelling. They afterwards repeatedly "lengthen their cords and strengthen their stakes" according to their requirements.

"Our rivers abound with *fish* of various kinds, which at particular seasons derive a principal part of their food from insects, as the numerous species of the salmon and carp genus. These chiefly prey upon the various kinds of Trichoptera in their *larva* state called case or caddis-worms, and in their imago, May-flies." (*Kirby and Spence*, *Int. to Ent.*, *Letter IX.*)

The adult salmon proper, *Salmo salar*, is believed by the best authorities, to eat little or nothing during its sojourn in fresh water. It leaves the ocean fat and returns to it emaciated. The above remark, therefore, does not apply to *Salmo salar;* but it does apply to others of the genus, and especially to the English *Salmo fario*, or common trout; and the Canadian *Salmo fontinalis*, the brook trout; and *Salmo naymacush*, the lunge. The lake shad (*Coregorius albus*), also is well known to have a keen relish for the Phryganidæ in their winged state. — *Report of Ontario Entomological Society*.

Educational Museums of Vertebrates.*

FROM what is known of man's present constitution and environment, and from what is commonly believed respecting his future form, condition, and associates, it seems to follow that all kinds and degrees of zoölogical instruction, whether anatomical, histological, physiological, pathological, psychological, or religious, should be based upon some knowledge of vertebrated animals. As aiding to make this knowledge real and lasting, every educational institution, of whatever grade, should have a vertebrate museum.

From many vertebrate collections the average visitor carries away, besides the sense of fatigue, certain impressions which are inadequate or erroneous, or if correct, uncomplimentary.

The following plans and methods are followed in a preliminary re-arrangement of the vertebrate collections at Cornell University: The exhibition-cases should contain only specimens which can instruct or interest the visitor. Not only should facts be displayed, but fundamental principles should be illustrated. Quality is more important than quantity, and arrangement is usually more needed than acquisition. True economy consists in paying liberally for what is wanted, rather than in taking what is not wanted as a gift. The usefulness of a specimen, and thus its real value, is to be measured, not by its rarity or cost, but by the degree in which it exemplifies important facts or ideas. Many specimens should not only be labeled, but also accompanied by figures and explanations.

In addition to, or more often in place of the three great series — physiological, taxonomic, and geographical — which are commonly attempted in museums, but which it is rarely possible to complete, specimens representing an equal amount of time or money would have a higher educational value if divided among a considerable number of special series, each illustrating some morphological or teleological principle.

Some of these series are strictly artificial, yet useful; as, *e. g.*, animals exterminated by man; those which supply us with food, medicine, weapons, clothing, or materials for habitation; fabulous, mythical, and sacred animals; and those which are mentioned by Shakespeare, and in the Scriptures.

Instead of vainly attempting to obtain and exhibit all the species of all the groups, most educational museums would attain more satisfactory results by selecting the more interesting or instructive forms from all classes, and limiting their efforts to complete groups for a few, upon which, as well as upon a larger number, may be illustrated the principles of classification, and of individual and geographical variation.

Among special series other than systematic, are *analogous forms and structures* which are sometimes mistaken for one another, but more readily discriminated when brought together. Such series are the rostrated animals, spinous forms, and those which have parachutes. *Physiological series* would contain the hibernating animals, those which are blind or nearly so, and such as are provided with scent-glands, tusks, and all poisonous vertebrates.

A *local collection* should embrace all the animals of the vicinity, and will benefit the student, both as an example for him to follow or improve upon, and as exemplifying the laws of geographical distribution and the influence of environment. The local collection need not contain anatomical preparations, but should exhibit both sexes, and all stages of growth of each species,— its mode of life, friends and foes,— so as to interest also the children, farmers, fishermen, hunters, and other residents of the neighborhood.

Although more than a quarter of a century has passed since the modern scientific doctrines respecting the methods of creation began to be accepted; although opposition to the general idea of organic evolution is now nearly confined to the stubborn and ill-informed; and although its substantial truth is tacitly admitted, or openly claimed, in nine out of ten higher educational institutions in this country,— I have yet to learn that any considerable part of a college museum has been specifically devoted to the exhibition of the facts which are described or figured in most zoölogical manuals, and in many works upon popular science.

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*Taken from the abstract, in *Science*, of the address of Dr. Burt G. Wilder, before the American Association for the Advancement of Science, 1885.

CHECK-LIST OF BRITISH LAND SHELLS.

J. RITCHIE, JR.

Arion ater Linn.
flavus Müller.
hortensis Fer.
Geomalacus maculosus Allman.
Limax agrestis Linn.
arborum Chant.
flavus Linn.
gagates Drap.
levis Müller.
marginatus Müller.
maximus Linn.
tenellus Müller.
Testacella haliotidea Drap.
maugei Fer.
Vitrina pellucida Müller.
Zonites alliarius Miller.
cellarius Müller.
crystallinus Müller.
excavatus Bean.
fulvus Drap.
glaber Studer.
nitidulus Drap.
nitidus Müller.
purus Alder.
radiatulus Alder.
Patula aculeata Müller.
pygmæa Drap.
rotundata Müller.
rupestris Studer.
Helix arbustorum Linn.
aspersa Müller.
cantiana Montagu.
caperata Montagu.
carthusiana Müller.
concinna Jeffreys.
ericetorum Müller.
fusca Montagu.
hispida Linn.
lamellata Jeffreys.
lapicida Linn.
nemoralis Linn.
obvoluta Müller.
pisana Müller.
Helix pomatia Linn.
pulchella Müller.
revelata Fer.
rufescens Pennant.
sericea Müller.
variabilis Drap.
villosa Drap.
Buliminus acutus Müller.
montanus Drap.
obscurus Müller.
Cionella acicula Müller.
lubrica Müller.
Agraulina tridens Pulteney.
Pupa marginata Drap.
ringens Jeffreys.
secale Drap.
umbilicata Drap.
Vertigo alpestris Alder.
angustior Jeffreys.
antivertigo Drap.
edentula Drap.
lillieborgi Westl
minutissima Hartmann.
moulinsiana Dupuy.
pusilla Müller.
pygmæa Drap.
substriata Jeffreys.
Balia perversa Linn.
Clausilia biplicata Montagu.
laminata Montagu.
parvula Studer.
rolphii Leach.
rugosa Drap.
solida Drap.
Succinea elegans Risso.
oblonga Drap.
putris Linn.
Alexia bidentatus Montagu.
denticulatus Montagu.
myosotis Drap.
Carychium minimum Müller.
Cylostoma elegans Müller.
Acme lineata Drap.

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First Meeting of the Franklin Society Sept. — 1885.

BY PROF. W. WHITMAN BAILEY.

THEY come from the hills, and the bright sunny fountains,
They come from the rivers, the plains, and the mountains,
From sea-side and summit our savants return,
While we of the laity anxiously yearn
To scrape up the bits which by accident fall
From the table they spread in their banqueting-hall.
How ruddy and brown, too, our travelers look,
From lengthened perusal of Nature's own book:
'Tis surely salubrious diet they found
Wherever they 'stablished their fair hunting-ground.
Oh! could we but into their diaries peep,
Perhaps we would find what might well murder sleep,
So great would the interest be in the notes
Of fossils upturned and of dredging from boats,
How the devil fish reared his extensible arm,
How the catamount yelped, how the hare gave alarm,
How the screech owl in agony hooted until
The timid supposed him the prophet of ill,
How the loon o'er the lake like a lost spirit moaned,
And how with rheumatics a bed-fellow groaned;
Could we see in their boxes, a wealth we'd behold —
Fine crystals of quartz and pyrites like gold,
Orthoceras shells, and perhaps ammonites,
Pterodactyls and mammoths and small trilobites;
Here bits of stone pestles and arrows and bones,
And here see the rubbish, a mass of loose stones.
Now into port-folios we venture to gaze,
For this is the botanist's province always,
And from the rare weeds and the flowers they press,
The region they traveled perhaps we can guess.
But suppose these *thesauri* are hid from our view
By our churlish companions, what *are* we to do?
We must wait till they turn on their river's of talk,
Or give thought expression by pencil or chalk.
But for one, we must own our impatience is great —
Mr. President, start them; we really can't wait.

SINCE the writing of the following article on the Hoary Bat a fine specimen has been shot in East Providence, R. I., and is now in the possession of Mr. G. W. Field.

Hoary Bat.

ATALAPHA CINEREA (BEAUVOIS) PETERS.

DR. C. Harte Merriam says the capture of a specimen of the Hoary Bat must for some time to come be regarded as an event worthy of congratulation and record.

We cannot boast of having captured one, but have just been so fortunate as to receive one alive from West Freetown, Mass., It has since become the property of Brown University.

As we have never before seen a living specimen, and no capture has been recorded for Rhode Island, we can do no better than to quote liberally from a most interesting article by Dr. Merriam in the *Transactions of the Linnæan Society*, Vol. II., p. 77:

"The Hoary Bat can be recognized, even in the dusk of evening, by its great size, its long and pointed wings, and the swiftness and irregularity of its flight. It does not start out so early as our other bats, and is consequently more difficult to shoot. The borders of woods, water-courses, and roadways through the forest are among its favorite resorts, and its nightly range is vastly greater than any of its associates.

"Imagine for a moment, sympathetic reader, that you are an enthusiastic bat-hunter, and have chanced to visit some northern forest where this handsome species occurs. The early evening finds you, gun in hand, near the border of a lonely wood. The small bats soon begin to fly, and in the course of fifteen or twenty minutes you may have killed several, all of which prove to be the silver-haired species (*Vesperugo noctivagans*). The twilight is fast fading into night, and your eyes fairly ache from the constant effort of searching into obscurity, when suddenly a large bat is seen approaching, perhaps high above the tree-tops, and has scarcely entered the limited field of vision when, in swooping for an insect, he cuts the line of the distant horizon and disappears in darkness below. In breathless suspense you wait for him to rise.

crouching low that his form may be sooner outlined against the dim light that still lingers in the northwest, when suddenly he shoots by, seemingly as big as an owl, within a few feet of your very eyes. Turning quickly you fire, but too late! He has vanished in the darkness. For more than a week each evening is thus spent, when, perhaps, on a clear cold night, just as the darkness is becoming too intense to permit you to shoot with accuracy, and you are on the point of turning away, something appears above the horizon that sends a thrill of excitement through your whole frame. There is no mistaking the species — the size, the sharp, narrow wings, and the swift flight serve instantly to distinguish it from its nocturnal comrades. On he comes, but just before arriving within gun-shot, he makes one of his characteristic zig-zag side-shoots, and you tremble as he momentarily vanishes from view. Suddenly he reappears, his flight becomes more steady, and now he sweeps swiftly toward you. No time is to be lost, and it is already too dark to aim, so you bring your gun quickly to your shoulder and fire. With a piercing, stridulus cry, he falls to earth. In an instant you stoop to pick him up, but the sharp grating screams, uttered with a tone of intense anger, admonish you to observe discretion. With delight you cautiously take him in your hand, and hurry to the light to feast your eyes upon his rich and handsome markings. He who can gaze upon a freshly killed example without feelings of admiration, is not worthy to be called a naturalist.

"The Hoary Bat occurs about the Red River settlement in British America, and Dr. Richardson obtained it at the Cumberland House on the Saskatchewan, in lat. 54° N. Robert Kennicott procured it in the Hudson Bay Company's territory, further north than any other species of bat has been taken. It is a summer resident of high latitudes. In the West it has been taken in Arizona and New Mexico, but only, so far as I am aware, at considerable altitudes. In fall and winter, isolated individuals have been procured from localities so far to the southward of its usual habitat, that I am constrained to believe it a migratory species. Nothing appears to be known about the breeding habits of the Hoary Bat. On the evening of the 30th of June, 1883, Dr. A. K. Fisher shot a large female (measuring 422 mm. in spread of wings) at my home in Lewis County. It had already given birth to its young, and each of its four mammæ bore evidence of having recently been nursed.

"That the species ruts about the first of August there can be no reasonable doubt, for I saw more of them from the 30th of July till the 6th of August than I have ever seen in all, before or since, and twelve adult specimens killed during that brief period were all males. They were not feeding, but were rushing wildly about, evidently in search of females. Many flew so high as to be out of range, though directly over head. The only young one I have ever seen was shot here August 6, 1883, by Walter H. Merriam. It was nearly full grown (measuring 400 mm. in extent) and different from the adults chiefly in being lighter colored."

John Snowdon Howland.

J. S. Howland, better known as Snowdon Howland, died at his home, Newport, R. I., September 19, 1885. He was a cripple from hip disease, caused by bathing too frequently in the salt water when a boy. Though a great sufferer, and for many months at a time confined to his bed, he was ever cheerful.

He was one of our best oölogists, and the collection he leaves is second to none in quality and very few exceed it in size. The taste with which it was arranged in his cabinets was such as to make it attractive even to those not interested in such things.

We can all appreciate the pleasure of making a collection, but probably few of us can realize the satisfaction it gave him, or how much it alleviated his years of suffering.

While we miss one whom we have so respected and honored, we cannot feel sad when we think that his sufferings have ended.

F. T. J.

The new *Check List of North American Birds, and Code of Nomenclature*, adopted by the American Ornithologists Union, will be issued during the coming December. It will be an octavo volume of about 300 pages.

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. VII.

Quercus coccinea — SCARLET OAK.

Q. coccinea, or the scarlet oak, is frequently met with in Rhode Island. It grows in company with the black oak, *Q. tinctoria*, to which it is closely related. Indeed, in a grove of the two kinds, they pass into each other by such fine gradations that it is only by a few points of distinction that they can be distinguished from each other.

It is one of the handsomest of our native oaks, more noticeable for its graceful, shapely growth than for the strength and sturdiness which characterize most of the oaks.

Upon open grounds it forms a somewhat stately, orbicular head. The limbs are numerous, long, and, for an oak, rather slender, dividing into fine branchlets, which give an airy lightness to the aspect of the tree. The trunk is usually straight and covered with a bluish gray bark, divided, but not deeply, by short clefts. The bark is not as thick as that of the black oak, not so dark, nor so deeply cleft. The inner portion of the bark is of a pink or reddish tinge, while that of the black oak is yellow. The buds are conical, obtusely pointed, and smaller than those of the black oak. The leaves are smaller, more deeply cleft, and thinner than those of the black oak. In the autumn, they are of a brilliant scarlet and form one of the most attractive beauties of the woods.

The acorn is small, nearly globose, but somewhat lengthened, deeply set in the cup, which has large, close scales, that terminate abruptly, without fringe. The kernel is white and much less bitter than that of the black oak. The wood is inferior, both as fuel and timber, to that of the black oak, with which it is commonly confounded, except by close observers.

Although not the most stately of our oaks, it is a rapid grower, and on account of its beauty at all seasons, and especially in the autumn, it is deserving of cultivation as a shade and ornamental tree.

This tree reaches a high degree of perfection in Rhode Island. In its distribution, it occupies the same regions as the black oak, the latter being regarded by recent botanists as simply a variety of the scarlet oak.

There are a number of fine scarlet oaks, of well-marked characteristics, by the roadside leading from Olneyville to Dyer's nursery; and in the grove opposite to the entrance to the grounds may be found some specimens of interesting varieties of the black and scarlet oaks. It may be here properly mentioned that the groves and river banks in the vicinity of Mr. Dyer's residence offer a noteworthy variety of finely-developed native forest trees.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XIV.

2. *Rana catesbiana* Shaw. (*Rana pipiens* Linn. The Bull Frog is the largest anurous Batrachian of North America, specimens having been known which measured twenty-one inches in length. Though the larger representatives of the succeeding species are often confused with this animal, a full-grown Bull Frog, with all its independence, thoughtful air, and perfect composure, is never to be mistaken. Lest, however, the more immature representatives be mistaken for their more plebeian associates, a few characteristic points, which will determine their identity, will perhaps be acceptable to the novice.

The most striking difference is in the so-called cuticular folds: a pair of ridges passing posteriorly from the back of the eye, over the tympanic membrane. These folds in the Green Frog continue as far as the last vertebra, outlining in their course the position of the distal ends of the transverse processes of the several vertebræ. In the Bull Frog these folds stop soon after passing the large drumhead-like areas behind the eyes — the tympanic membranes. The Bull Frog is also without the underlying metallic tint generally characteristic of the Green Frog. Other differences in color are misleading and cannot be relied upon for specific determination. The color and even the marking being likely to vary in either species.

I have captured specimens of the Bull

Frog when they were of the most beautiful pale emerald, and marked with spots and blotches of the lightest brown. A few hours of confinement have sufficed to render them of a deep brown color, the green almost entirely disappearing, and the maculation only appearing on the closest scrutiny.

Though familiar to every one, the Bull Frog is not the most abundant species of the genus. It is often seen by those rowing on our ponds and rivers, as it sits on some warm bank, ready to plunge into the water on being too closely observed. It will generally, however, allow one to approach near enough to drop a small grapple, decorated with some bright-colored worsted, before its capacious mouth, and, judging the value of its food from its appearance only, the fastidious patriarch soon finds himself in the angler's fish-basket, from which he will only emerge in piecemeal to lure the equally omnivorous pickerel, or to garnish the table of the epicure.

As to the voracious nature of this animal Mr. J. A. Allen writes:

"I have taken from its stomach young specimens of *Chrysemys picta* an inch and a half in length. And woe be to the hapless young frog that hops into a pool where sits one of these greedy monsters! When collecting birds I have on several occasions had specimens, which fell into the edge of the pond when shot, stolen by them. In one instance a medium-sized Bull Frog seized and attempted to swallow a cedar bird (*Ampelis cedrorum*) that had fallen near him; he succeeded to his apparent satisfaction, although the tips of the wings and tail of the specimen projected from his mouth, while he sat composedly waiting for the other end to digest. On another occasion a more active fellow gobbled up a rare Warbler that chanced to drop near the water, and, to my great disgust, swam off with it beyond my reach. Many farmers have learned by sad experience of their ability to swallow small ducklings."

The geographical distribution of the Bull Frog is extended, it being found from Quebec to California, and from the great lakes to the Mexican Gulf; in these limits, however, it is most abundant in the northeastern portions.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXII.

FAMILY 60. Patellidæ. The shells comprising this extensive family are called limpets. They are not spiral like most of the gasteropods, but dish-shaped, more or less conical; the aperture comprises the entire under side, and of course they have no operculum; they adhere to stones and are not easily detached unless we come upon them unawares. The family is divided into three sub-families, Lepetinæ, Acmaeinæ and Patellinæ, the second of which only is represented in Rhode Island.

Sub-family Acmaeinæ contains four genera and about thirty species. The only species inhabiting our state belongs to the genus Acmæa, Esch., sub-genus Collisella, Dall.

67. ACMÆA (COLLISELLA) TESTUDINALIS, MÜLLER, 1766.

Syns.:

Patella testudinalis, Müll., Fabr., Dill., Wood., Lam.
Patella clealandii, Sly., Flem.
Patella amœna, Say.
Patelloidea amœna, Carth.
Patelloidea testudinalis, Lea, DeKay.
Lottia testudinalis, Gould.
Lottia antillarum, Sly.
Patella clypeus, Brown.
Tectura testudinalis, Stimp., Dall., Perkins.
Collisella testudinalis, Dall., 1870.

The above list of synonyms are but a few of the many names which have been given to this species. It is a very common species in the boreal regions of Europe, Asia, and America. It extends southward in Europe to England and France; to Japan in the North Pacific; inhabits Greenland to Cape Cod, but rare south of it. It has been quoted from Watch Hill, R. I., but I have never heard of any author speaking of it except as an ocean species, that is, found on ocean shores, but it is found in our bay at Warwick Neck lighthouse, and as far up as Rocky Point, at least fifteen miles from the ocean. Our specimens are small, from one-half to three-quarters inch in length, but in Maine they are an inch, and in Europe one and a half inches long. They are very abundant in Norway, Scotland, and Ireland, where they are used for bait, and in times of scarcity, for food.

A description of this species is difficult, as the individuals vary so widely. Shell oblong-oval, elevated; apex behind the centre, pointed and turned towards the head of the animal; color greenish-white, with brown stripes; within, the centre is generally dark brown, and the margin checkered with brown and white spots. It resembles in form, though on a larger scale, our common fresh-water limpet, Ancylus fuscus. Its habitat is on stones from low-water mark to twenty fathoms or more.

There is a variety of this species whose habitat is only on the narrow leaves of Zostera marina (eel grass). Whether this is only a variety of testudinalis or a distinct species, I am not prepared to say; many authors consider it distinct, and it certainly differs as much in appearance, and more so than some species which are universally acknowledged to be distinct. If the normal testudinalis resembles Ancylus fuscus, Ad., this variety still more resembles our other fresh-water limpit, Ancylus parallellus, Hald. The specimens do not vary as much as the testudinalis, but are very uniform. The shell is long and narrow, only three-tenths of an inch broad by one-half inch or more in length; the sides compressed, thin and fragile; ends obtusely rounded; color reddish-brown, checkered with yellow oval or circular spots; the interior showing the exterior markings. This species is called Alveus, Conrad, var., or, by those who consider it distinct, Acmæa (Collisella) alveus, Con. I am disposed to think it a distinct species by itself.

ORDER POLYPLACOPHORA, GRAY.

FAMILY 61. Chitonidæ, Guilding. The order Polyplacophora differs from the other orders of the sub-class Prosobranchiata in both animal and shell. In this order the sexes are united in each individual, while the shell is multivale, or composed of eight separate transverse plates, inserted in a coriaceous mantle, forming an extended margin around them. There is but one family, as above, and two genera, Chiton and Chitonellus.

GENUS CHITON, LINNÆUS, 1758.

The earlier naturalists considered these unique shells to belong to the Malentozoaria of Blainville, or articulated mollusks, and included them among the Barnacles or Crustacæ; they also called them multivalves. They were deceived by the appearance of the shell, which consists of eight arched plates, but are not valves, as were supposed, nor articulated in any way, but arranged like shingles on a roof, and let into the tough mantle of the animal, at the ends, by the sharp, smooth edges. These plates are more or less sculptured, and the margins either bare or covered with hairs, spines, or other ornamentation. They are found in all parts of the world, but unlike most shells, the finest species are not tropical, but inhabit the colder shores of North and South America. There are more than 250 species, divided among about fifty sub-genera. Seven species are credited to New England, of which two are known to inhabit Rhode Island. Possibly some of the others may yet be found here. The two species known to inhabit our bay are as follows:

68. CHITON (CHÆTOPLEURA) APICULATUS, SAY.

Shell oblong-oval, color grayish; anterior plate a crescent, with three or four concentric lines and numerous dots arranged in regular lines along the margin; the next six plates have on their dorsal triangles, twenty to thirty longitudinal series of beads, or pointed, elevated dots; on the lateral triangles, which are elevated above the dorsal ones, are scattered dots like those on the anterior plate; posterior plate, with the series of dots like those on the dorsal triangles of the six central plates, a central tubercle, and the remainder with scattered dots like those on the anterior plate. Margin coriaceous, with alternate stripes of white and dusky pubescence. Length one inch, breadth three-fifths. It inhabits from South Carolina to Cape Cod, and is found on stones in dredging and on dead shells of Busycon, Natica, etc.

69. CHITON (TRACHYDERMON) RUBER, LOWE.

Shell small, oval, elevated, carinated; plates smooth and shining, even under the lens; color light red, sometimes with flashes of crimson across one or two plates; the keel at the centre is sometimes striped with crimson spots; interior rose-red, paler at the margins. Length one-half inch, breadth three-tenths.

Found in the maws of fishes and on stones dredged from deep water. Habitat from Connecticut to Greenland, Iceland, Norway, and Great Britain.

All Chitons when disturbed roll themselves up into a ball, and on this account are sometimes called sea-woodlice. In collecting the smaller kinds it is better not to try to separate them from the shell or stone to which they may be attached, but take home shell and stone together. If the animal is killed when rolled up in a ball, the shell cannot be straightened again without breaking it; the only way is to place the Chiton between two boards after it has straightened itself, and kill it with hot water, and let it remain between the boards until the shell stiffens in this position, otherwise its tendency is to roll up, even when the animal is dead.

ORDER NUCLEOBRANCHIATA.

These are pelagic animals, swimming by means of fin-like lobes of the foot; some have a transparent, glassy shell, others have no shell at all. There are three families, five genera and about fifty species, all absent from our fauna.

This chapter completes the description of all the species of mollusca which inhabit Rhode Island, belonging to the first subclass of Gasteropoda.

(*To be continued.*)

An Uncommon Fish.

SINCE the last issue of RANDOM NOTES, there has been secured, from a seine in Greenwich Bay, a specimen of *Selene vomer*, or, as it is more popularly called, the Moon Fish or Horse Head. The latter name is particularly applicable, as the face bears a striking resemblance to those seen on ancient coins representing the Roman charger, a resemblance carried still further by the mane-like disposition of the dorsal fins. In the general outline the Horse Head is of an irregular pentagonal form, nearly as deep as it is long, and so compressed, that the greatest distance from side to side measures no more than the diameter of the eye.

The most striking features, however, are the elongated portions of the dorsal and ventral fins. By actual measurement the dorsal filaments are in length more than twice the depth of the fish. These filaments are remarkably like the waxed-ends of a shoemaker. The Cobbler Fish is the nearest relative to the Horse Head.

Though the present species is immature, measuring only three inches in length, specimens from other localities have been found of nearly twice this size.

In its geographical distribution this animal is found in the warmer seas of both the Atlantic and Pacific, its northern limit being, heretofore, Long Island Sound.—H. C. BUMPUS.

The Click Beetle, Skip Jack, or Spring Beetle.

BY H. H. VEITCH.

THERE are many different kinds of beetles in Worcester County, known under the above names, and all belong to one family, the *Elateridæ*. It is of the genus *Agriotes* that I would write in particular. The different species of this genus are the parents of the wire-worms that abound in most gardens, and are considered by farmers so injurious to vegetation.

These beetles may be found in the field or garden from June to September among piles of rubbish or rotten sods. They lay their eggs in July and August, attaching them to the roots of vegetables, such as potatoes, corn, beans, peas, etc., in little clusters containing forty or more. These hatch out in September and October, and the young larvæ find sufficient food to last until spring in the decomposing roots to which the eggs are attached.

In cultivating my garden in May I have often turned over clusters of these wire-worms adhering to the roots upon which the eggs were deposited the previous summer. At this stage of their development they are about an eighth of an inch in length, and not exceeding a horse-hair in thickness. They now separate, and in future it is each one for itself.

When a year old, they acquire the shining mahogany brown color characteristic of the larvæ of the *Elateridæ*. The second year finds them the common wire-worms. In June and July of the third year, they complete their growth.

The larva now swells, the skin becomes greatly distended; at length it ruptures longitudinally and the perfect insect issues. I would state for the benefit of farmers that fall plowing will not destroy these pests. I have this winter subjected the tiny larvæ to a cold of fifteen degrees below zero, without the slightest injurious effect.—*Worcester County Naturalist.*

The Tragopans, or Horned Pheasants

(*Ceriornis*),

Have a powerful body, moderate-sized wing, and short, broad tail, composed of eighteen feathers. The bill is very short and rather weak, while the strong, flat foot is furnished with a spur. Two small, fleshy, horn-like appendages are situated behind the bare patch around the eye, and the naked skin on the throat is prolonged so as to form a pair of pendant lappets. The rich plumage of the male lengthens into a crest at the crown of the head, and is most beautiful both in its hues and markings, whilst that of the female is comparatively of sombre tint.

THE SIKKIM HORNED PHEASANT.

The Sikkim Horned Pheasant (*Ceriornis Satyra*) is of a bright carmine-red on the brow, crown of the head, nape, and shoulders; a broad band, that passes from the temples to the back of the head, and a narrow line around the lappet at the throat, are also of the same glowing hue; the upper back, breast and belly are red, enlivened with white spots edged with black; the mantle and upper tail-covers are brown, but each feather is delicately striped with black, and has a black spot at its extremity; some of the feathers on the upper wing-covers are also dotted with red, the dark-brown quills are bordered and streaked with dull yellow; the tail-feathers are black, striped with dark brownish-yellow.

The eye is deep brown, and the foot yellowish-brown; the fleshy appendages and lappets are blue, spotted here and there with orange-yellow. The male is twenty-seven inches long, the wing measures eleven inches and a half, and the tail eleven inches. The plumage of the female is principally brown, darkest on the back, and enlivened by numerous black and red spots and streaks, as well as by the white shafts and dots of the feathers. Her length is only twenty-four inches, and that of her tail ten inches.

This species, which was the first known to naturalists, inhabits the Nepaul and Sikkim Himalayas, being more abundant in the former. "I have," says Jerdon, "seen it in spring at an elevation of about 9,000 feet above the level of the sea; and in winter it descends to between 7,000 and 8,000 feet in the vicinity of Darjeeling, and perhaps lower in the interior. It is frequently snared by the Bhotees and other Hill-men, and brought alive for sale at Darjeeling. Its call, which I have heard in spring, is a low, deep, bellowing cry, sounding like "waa-ung-waa-ung." Its general habits are no doubt similar to those of the *C. melanocephala*, which have been more accurately described."

THE JEWAR, OR WESTERN HORNED PHEASANT.

The Jewar, or Western Horned Pheasant (*Ceriornis melanocephala*), differs from the species last mentioned principally in the predominance of black in the coloration of the under side. In the male the feathers on the top of the head are black, with red tips; the nape, upper part of the throat, and shoulder are scarlet; the feathers on the mantle dark brown, ornamented with very delicate black lines, and, towards their extremities, with small black-edged white spots. The feathers on the breast and belly are black, spotted with white, and slightly shaded with red; the quills are pale black, spotted and edged with brown; the tail is black, striped with brown and white at the ends of the feathers. The eye is nut-brown, the bare patch that surrounds it bright red, while the fleshy horns are pale blue; the lappets on the throat are purple, dotted with light blue at the sides, and bordered with flesh-pink; the beak is horn-grey, and the foot reddish. The male is from twenty-seven to twenty-eight inches long, and from thirty-five to thirty-six broad; the wing measures ten inches and a half; and the tail ten inches. The plumage of the female is varied with different shades of brown and black on the upper parts of the body, and with greyish brown, black and white on the under side; the back is enlivened by pale yellow markings, and the under side by irregular white spots. The length of the female is twenty-three inches, the breadth thirty-one inches and a half; the wing measures nine inches and a half, and the tail eight inches and a half.

These birds are found from the western borders of Nepaul to the extreme Northwest Himalayas; they are not very common near Simla and Mussooree, but are more plentiful near Almora.

"Their usual haunts," says "Mountaineer," "are high up, not far from the snows, in dense and gloomy forests, where they live either alone or in small scattered parties. In winter they descend the hills, and then their favorite haunts are in the thickest parts of the forests of oak, chestnut, and morenda pine, where the box-tree is abundant, and where under the forest trees a luxuriant growth of 'ringalt' or the hill bamboo forms an underwood in some places almost impenetrable. They keep in companies of from two or three to ten or a dozen or more, not in compact flocks, but scattered widely over a considerable space of forest, so that many at times get quite separated, and are found alone." Jerdon tells us, "that if undisturbed they generally remain pretty close together, and appear to return year after year to the same spot, even though the ground be covered with snow, for they find their living then upon the trees. If driven away from the forest by an unusually severe storm or any other cause, they may be found at this season in small clumps of trees, wooded ravines, or patches of low brushwood.

"At this season, with the exception of its cry of alarm when disturbed, the Jewar is altogether mute, and is never heard of its own accord to utter a call or note of any kind; unlike the rest of our pheasants, all of which occasionally crow or call at all seasons. When alarmed it utters a succession of wailing cries, not unlike those of a lamb or kid, like the syllables 'waa, waa, waa,' each syllable uttered slowly and distinctly at first, and more rapidly as the bird is hard pressed and about to take wing. Where not repeatedly disturbed it is not particularly shy, and seldom takes alarm till a person is in its immediate vicinity, when it creeps slowly through the underwood, or flies up into a tree; in the former case continuing its call till again stationary, and in the latter till it has concealed itself among the branches. If several are together all begin to call at once, and run off in different directions, some running into the trees, others running along the ground. When first put up they often alight in one of the nearest trees; but if again flushed the second flight is generally to some distance, and almost always down-hill. Their flight is rapid, and the whirr produced by the wings peculiar, so that even when the bird is not seen it may be distinguished from any other species. Where their haunts are often visited, either by the sportsmen or the villagers, they are more wary, and if such visits are of regular occurrence and continue for any length of time, they become alert in a very high degree; so much so that it is impossible to conceive a forest bird more shy or cunning. They then, as soon as aware of the presence of any one in the forest, after calling once or twice, or without doing so at all, fly up into the trees, which near their haunts are almost always evergreens of the densest foliage, and conceal themselves so artfully among the tangled leaves and branches that unless one has been seen to fly into a particular tree, and it has been well marked down, it is almost impossible to find them. In spring, as the snow begins to melt on the higher parts of the hills, they entirely leave their winter resorts, and gradually separate and spread themselves through the more remote and distant woods, up to the region of birch and white rhododendron, and almost to the extreme limits of forest. Early in April they begin to pair, and the males are then more generally met with than at at any other period; they seem to wander about a great deal, are almost always found alone, and often call, at intervals, all day long. When thus calling, the bird is generally perched on the thick branch of a tree, or the trunk of one which has fallen to the ground, or on a large stone; the call is similar to the one they utter when disturbed, but it is much louder and only one single note at a time — a loud energetic 'waa,' not unlike the bleating of a lost goat — and

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HAVING been for more than a year, unable to use my eyes for any close work, and with no prospect of recovering their use for many months to come, I sold, on Oct. 30, 1885, my interest in the firm of Southwick & Jencks to my partner James M. Southwick. With many thanks for patronage in the past I would ask a continuance of the same to him in the future.

FRED. T. JENCKS.

Harbor Seal.

PHOCA VITULINA, LINN.

THIS animal, the only representative of the family commonly found on the eastern coast of the United States, presenting so great variety in size and color, is known in different localities by different names. From its abundance in bays and harbors it is often called the Bay or Harbor Seal, and being not infrequently found in fresh water, it is known, especially further north, as the River Seal.

The geographical distribution of this animal is extended. In America it is found along the Atlantic coast from Greenland to the Carolinas, and along the Pacific from Behring Strait to Southern California. It is not restricted to the New World, however, but is along the Scandinavian peninsula the commonest species, and extends its range further south, being occasionally met with in the Mediterranean. It is an animal that not infrequently ascends rivers, and is even found up the St. Lawrence as far as the Great Lakes, and has been taken in Lake Champlain. On the New England coast seals are commonly observed on the low islands, at the mouths of rivers or in sheltered bays, where they can sometimes be counted by the score as they lie basking in the sun, or quarelling with one another. On surprising such a colony, with a splash, all have disappeared, though their heads can soon be seen as they come to the surface for air, or to examine more closely the object of their fright. They now often utter a quick bark or gutteral whine, which, together with their canine-like head, has given rise to the name which is sometimes applied to them, Sea Dog.

In our bay the seal is found throughout the year, though more abundantly seen during the winter months. About two years since a specimen was killed at Riverside, the skeleton being now deposited in the museum of Brown University. A mounted specimen, also captured in the bay, is to be seen in the cabinet of the Franklin Society.

Few mammals present greater variation in color than the present. Specimens range from a uniform yellowish-brown to uniform dark brown, and sometimes nearly black, and are spotted with blotches lighter or darker than the underlying shade. The more common coloring, however, is brownish-yellow with darker spots and patches, the lips and eye-lids being lighter rusty yellow. The males, which exceed the females in size, sometimes measure six feet in length. The young at birth are a uniform soiled or yellowish-white, changing to the ordinary darker shades at the first molt, this occuring before, or within three or four days.

An interesting account is given of one which was born in the gardens of the Zoölogical Society of London. Immediately after its birth it, by rolling and turning about, completely divested itself of its outer covering of *fur* and *hair*, which formed a mat upon which it rested for several hours.

The rutting season is supposed, from reports made by the Newfoundland fishermen, to be in September, the young one from each mother being born the following May. In these northern seas the skins of this animal, called the Hair Seal, are regarded as being of considerable value on account of the beautiful markings which they present, and are used for coats, caps, gloves, women's underwear, and to cover trunks, boxes and canoes. The flesh is also of value, being considered the most palatable of seal-beef, though this, to the uninitiated, is saying but little. In capturing fish they are very active, destroying large numbers, and not infrequently taking them from the net of the fisherman, even while he is at work.

In domestication the Harbor Seal becomes very docile, and soon learns to perform many odd tricks, though they are often troubled, while in artificial reservoirs of water, by their eyes becoming sore and inflamed.

The first description of this animal was made by Linne in 1754, since which time, as a result of its extended geographical range and wide range of variation in color and size, the animal has received over a score of synonyms by those who have had insufficient material for proper identification. It is more robust than most seals; has a large head, broad nose, and short limbs. The heavy dentition is very characteristic, the molars being broad and thick, and set obliquely in the jaw.

Victoria Regia.

WHILE collecting on the Amazon in the vicinity of Santarem, a small town situated at the mouth of the Tapajos River, I was fortunate enough to find a group of those immense water-lilies known by the name of the Victoria Regia. They were growing near the head of a lagoon among the tall grass which, in the wet season, floats and grows on the surface of the water. There were about a hundred leaves, and six or more blossoms.

The leaves were from four to seven feet in diameter, and the edge of the largest one I measured was nine inches above that portion of the leaf which rests on the water. The under side of the leaf is cellular, and resembles honeycombed tripe in everything but its color, and is covered with spines. The stem, which was an inch in diameter, was also covered with spines.

The bud was six inches from base to apex, and about four inches at the widest. The blossom when fully expanded measured over a foot across. When the bud first opens the flower is pure white. It then commences to turn pink, and the color deepens until the flower wilts, so that when a number of plants grow together one may find all shades of color from pure white to dark pink.

Each seed-pod contains about half-a-pint of seeds, and if the seeds when fresh are placed over a brisk fire they will pop, and can be used for food, tasting much like an inferior quality of pop-corn. The leaves as they float will sustain for a short time a considerable weight, but owing to their being full of holes, they cannot support more than a few pounds without eventually sinking.

On one of the leaves I found a nest of the jacana (Parra jacana). It was made of a small heap of grass and rubbish, and contained two strangely marked eggs.

The peculiar formation of the under side of the leaf gives considerable stiffness to it, and the formidable array of spines that cover this surface and the stem, no doubt, serves to preserve them from the attacks of animals. I could not make out whether the holes in the leaves were the work of insects, or of nature. Certain it is that if there were no holes the heavy rains of the wet season would fill the leaves and sink them. I gathered a large number of the seed-pods, and sent a quart or more of the seeds to a gentleman in Para, who sent them to England, where, I have since learned, they created considerable interest as the plants raised from them in hot-houses proved to be of a new variety. W. H. W.

I CLIP the following from J. V. R. Swan, acting Consul General's report at St. Petersburg, Russia. It contains some new facts, that will be of interest to your readers no doubt.

"In one of the villages in the government of Toula the peasants are interested in the breeding of canaries. Eighty homesteads thus find profitable occupation. The breedings are sold in Moscow and the neighborhood. In the huts engaged in this undertaking from five to ten breeding-cages are the average. This industry is also partly developed in other villages in the neighborhood of Toula. The breeding of canaries is also largely carried on in the government of Kalouga.

"In many villages of the Temnikoff district (government of Tamboff) pigeons are bred as domestic animals and their skins sold as peltries to the furriers and others, mostly Jews, who visit the weekly bazaars and fairs to make such purchases. This dealing in pigeon skins is a decided innovation of later times, and cruelly dispels the illusion of travelers and writers as to this bird's sanctity amongst the commonalty."

The skinning of pigeons to sell their pelts in commerce is something I do not understand unless they are intended for export to be used as hat trimmings.

Yours truly, JAS. M. WADE.

Our Friends the Spiders.

BY REV. FOREST F. EMMERSON.

[From the proceedings of the Newport Natural History Society.]

WE come now to the true web-builders, the spinners and weavers of nets. I shall endeavor to describe three classes of webs:

First. There is the regular geometric web of the common garden spider, though it is doubtful whether there is ever found a true geometric web. In a geometric web, truly such, the concentric circles would meet. But this is not the fact in the common spider's web. Instead of meeting the circles pass by each other as they come around to the point of starting, and thus form, not a geometric circle but a spiral. In the construction of this so-called geometric web, the guys and stays are first attached to surrounding objects; then the radii are made, running from a common centre to the circumference. The guys, stays and radii are made of a firm, dry, inelastic silk. When this preliminary framework is done, the spider weaves on the concentric circles, attaching each circle to each one of the radii by the direct application of the spinners so as to make them adhere. These circles, not only with this spider but with all spiders, are made of an elastic silk, covered with a viscid gum, which, after the line passes into the air, gathers on the thread in globules so numerous and so minute that it is estimated that on a web sixteen inches in diameter there are 100,000 of them.

Second. The eccentric web. The Charleston spider is known in the scientific books as *Nephila plumipes*, meaning the feather-footed golden fleece, so-called from the fact that there are bunches of feathery growth on the joints of its legs, while one pair of spinners produces a silk of very fine quality and of the color of gold. It was discovered during the war on the islands in Charleston harbor by an officer of our army who is a naturalist. It builds an eccentric web. The focus of this web is near the top where the spider takes position head downwards, waiting for prey. The radii, guys and stays of this web are made of inelastic threads of silvery color, while the circular lines are of elastic, viscid silk of golden color. Though usually making one thread of all the spinners, it is believed that spiders may use one or all of the spinners at will. But why the golden spinners should produce silk ordinarily dry when reeled from the body, and viscid when used for the concentric circles of the web is not as yet understood. It may be that the same spinner sends out the line and at the same time covers it with the viscid gum, or one spinner produces a filament while another covers it with the gum. At all events with three pairs of spinners the Charleston spider spins four kinds of silk; the golden dry, the golden viscid and elastic, the silver dry, and the pale blue.

As I have before intimated the circles of the web are not concentric, or spiral, as in the regular web of the common spider. They do not pass completely round a common centre, but are cast over the upper radii in loops and brought back upon themselves in an opposite direction, never passing a point above the focus. In this web some of the circles (and this is a peculiarity of this spider) as well as the radii, guys, and stays, are made of the dry silk.

Third. The triangular web. Professor Wilder, of Cornell University, found a spider a few years ago near Ithaca, N. Y., which does not seem to have fallen under the notice of observers elsewhere. He calls it the "triangular" spider, from the fact that it builds a web, not geometric or eccentric, but triangular in shape, and this triangular shape is proof of a purpose which shows almost human intelligence. A base line as a stay or support of the web is attached vertically to the trunk of a tree adhering only at the two ends. From this four lines, always this number and no more, start at equal distances from each other and converge to an apex, or acute angle, and then extend as a single line to some fixed point. These four lines correspond to the radii in the ordinary web, and the transverse elastic lines correspond to the concentric circles of the same. The web when finished is considerably longer than the distance between the two points of attachment, and this slack line is for a purpose which is the most striking evidence of the intelligence of this spider. The spider takes up the slack herself; and wonderful as is the piece of work which she has accomplished, her management of this web in taking her prey is still more wonderful. Although in spinning the ten transverse lines she is believed to make 9,000 movements with her hinder feet, yet, without a moment's rest, she takes her place when the web is finished, on the single line between the apex and the point of attachment behind her. Hauling the single line taut behind her with her hinder feet, she draws in the web and makes it taut with her first and second pairs of feet, precisely as a man would haul a sagging hammock by pulling at the single line at the end. The third pair of feet when desired may lightly hold the slack rope.

She is now ready for business. For hours, if necessary, she holds her place, pulling taut the line and keeping the web firm in position. When the unlucky insect comes in contact with her web, she suddenly lets go with her fore feet all the slack line, and the web being lower and heavier, the apex line is drawn taut, the net falls outward and downward upon itself in a kind of collapse, the transverse elastic and gummy lines are brought nearer together, and thus the entanglement of the prey is insured. The spider then creeps cautiously out on one of the radii, and if she is not sure of her game runs back, draws everything taut as before, and if the insect is still in the toils again lets go with a snap; she has been known to repeat this six times in succession before venturing a personal encounter with her victim.

But furthermore, and still more wonderful, she has another method of using her web. Contrary to the popular belief that animals have but one way of doing things, they often have several, conforming their action to circumstances. For sometimes this spider, instead of simply letting go the slack line, takes more desperate measures. Fastening a new line to the tree behind her for her support, and reeling from her body as she advances, keeping thus a line of possible retreat in the rear, she cuts the apex line with her jaws, still holding to the line in front of the cut she has made, and supported in the rear by the new line attached behind; she then again advances and grasps all the radii where they meet and cuts them with her jaws; advances again, rapidly, and bites off more still, holding by what remains with her fore feet; at each successive cut, as she advances, the web slackens, recoils and falls into collapse, just as it did in the former case when she simply let go the slack line, until, finally, spreading her feet far apart she gathers up the radii once more and with a quick movement throws the whole of the web like a blanket over her prey. Then grasping the whole mass she transfers it to the third pair of feet which roll it over and over, while she holds on to the ruin of the web alone with her fore feet, and with the hinder feet she draws out from her spinners broad bands of new silk, winding it around and around the struggling insect, now hardly visible. Having reduced insect, web, and all, to a rounded mass, she seizes the whole mass, the insect in his silken shroud, more dead than alive, and mounts with it to the recent scene of her waiting patience and there devours her prey. This spider thus completely sacrifices its web, the product of so much toil and skill, and the capture of a single insect involves the ruin of the cunning machine elaborately built to accomplish it.

As to webs in general, it may be said that as the radii are generally covered with the viscid gum, the web is very elastic, yielding to the struggles of insects without breaking, and withstanding the force of the wind. If the wind is strong, however, the spider shows her intelligence by loading the web with sticks and small pebbles to hold it firmly in place.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XV.

2. *Rana clamitans* Merrem. (*Rana fontinalis* Le Conte.) The Screaming, Green or Spring Frog is with us a most abundant animal, to be found at all periods of the year in those open brooks and springs which are not covered with ice, and inhabiting every ditch, small pool, or muddy brook during the spring and summer months. The young of this species are very abundant in the shallow valleys of our oak and chestnut woods, where they congregate in pools left by the melted snow, and, during the warmer portions of the day, scramble over the half submerged branches, or quietly bask in the sun's rays.

As a person wanders through the woods on a spring day, he is startled by suddenly surprising one of these happy colonies, the individuals of which, in their efforts to find concealment, splash into the water with screams of fright, there to immediately find no suitable hiding-place, however, but in a moment to let their uneasiness give way to curiosity as they allow themselves to come to the surface and eye the object of their confusion.

On observing one of the little fellows as he rests on the water, one is impressed with the singular example of protective resemblance which he exhibits. The general form presents no points contrasting with the surrounding twigs and irregularly curved leaves. The color is remarkably like that of the algæ, banded with dark stripes of a shade of rotten bark and maculated with spots of minute patches of fungus.

Though now of small size the Green Frog can be distinguished from the Bull Frog by the characteristic features given in the previous number.

The young Green Frogs are not always, however, allowed to thus live in peace and happiness, for not unfrequently there is concealed in some dark recess of their nursery a gigantic Bull Frog who makes a daily meal of one of their number, or, worse still, they are presided over by a pair of their own kind, possibly their own parents, who do not hesitate to make away with large numbers of the aspiring youth.

Like many other animals of wide geographical range, the present species, presenting in different localities different varieties, has been described under several different names. So eminent a naturalist as Holbrook considered the more northern representatives to be of a distinct species, following the description of Le Conte, describing them under the name of *Rana fontinalis*, a name, by the way, which is well chosen as illustrating the habits of the animal.

Though during the day the Green Frog remains so near the water that a few jumps will enable him to reach the element of comparative safety, in rainy weather when the grass is wet, and during the damp nights, he not infrequently wanders away from water in search of insect life or new fields of plunder. While on these excursions he may be surprised by the Night Heron, or picked up by the larger owls.

Rana clamitans is, with us, only exceeded in size by the Bull Frog. Specimens measuring over eight inches in length, from the snout to the tips of the toes, are not uncommon.

Successful Rearing of some Young Dusky Ducks.

I HAVE known of the experiment being tried more than once before without success, and have heard it emphatically asserted that the species was untamable; but my neighbor has exploded that theory and now has three of the birds among his flock of domestic Pekins, where they eat their share of the meal and assert their rights among the flock as eagerly as if they were to the manor born. This clutch of eggs was found by a boy and set under a hen, who brought out seven ducklings. Some escaped early from their pen and were seen no more. A neighbor's cat further despoiled the flock, when the remaining three were taken by my neighbor and attached to his flock of young Pekins with whom they at once affiliated and became ring-leaders in mischief and wandering where the old mother duck could not follow for the cord that tied her up. A roomy yard now detains them all, where they are developing in good shape, already over three months old. —J. N. CLARK.

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. VIII.

Quercus palustris — Pin Oak.

The *Quercus palustris* or pin oak is not a common tree in Rhode Island. It grows only in the southern part of the state, and sparingly there. It is found in the great Kingston swamp, occasionaly on the banks of the Pawcatuck River, and, probably, by the banks of streams leading into it. This is probably about on the line of the northern limit of this interesting tree. It grows more plentifully in the Central states of the Atlantic coast, where it attains the size of a large tree. In Central Park there is a magnificent specimen of this tree, seventy or more feet in height. It prefers a position where it can overhang a stream or pool, but will grow finely on dry ground. Near the Stonington railroad bridge, which spans the Pawcatuck near Wood River Junction, may be seen some well-developed specimens of this tree. Several old trees of this species overhang the stream just below the bridge, and others, young and thrifty, grow in the gravel embankment near by. The largest specimen I have seen is in Ashaway village, by a pool of water, north of the Baptist church.

This is the most graceful of our native oaks. The limbs divide into lithe, waving branchlets, which, especially near streams, have a weeping habit. The leaves are bright, with almost a metallic sheen, deeply cut, and on slender stalks. They are smaller than those of the other biennials.

Quercus illicifolia — Scrub Oak.

Quercus illicifolia or scrub oak, sometimes called "bear" oak, is common upon the sterile grounds of Rhode Island. Many acres are occupied by it, almost to the exclusion of other tree or shrub growth. Its worthlessness is its protection. It is too small for timber or even fuel, in most localities, and the cost of clearing land occupied by it is usually greater than the land is worth when cleared, unless near the city or populous villages.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

Chapter XXIII.

Sub-Class Opisthobranchiata.

This, the second sub-class of Gasteropoda, is composed of mollusks in which the sexes are united in each individual, while in the first sub-class Prosobranchiata, the sexes are separate. The animals of Opisthobranchiata are called sea-slugs, because the shells are small and thin, and either partially or wholly concealed by the animal. Some have an internal, others an external shell, while many are without any shell at all. There are two orders, Tectibranchiata and Nudibranchiata.

Order Tectibranchiata.

Family 62. Philinidæ. This family consists of nine genera, two of which, Philine and Scaphander, inhabit the Atlantic coasts of the United States. Three species of Philine inhabit New England, north of Cape Cod, and one, a new species, Philine amabilis, Verrill, was dredged 100 miles south of Newport in 120 fathoms. Verrill also reports four other species of Philine from Martha's Vineyard to Cape Sable, Nova Scotia. Two species of Scaphander are quoted, one from Casco Bay, Me., (S. puncto-striata), and a new species, S. nobilis, Verrill, off Martha's Vineyard, in 1,000 to 1,300 fathoms. These nine genera contain about forty-five species, none of which are found in Rhode Island.

Family 63. Tornatellidæ, composed of two sub-families, four recent and several fossil genera, is represented in Rhode Island by a single species.

70. Tornatella puntco-striata, Adams.

Syns.:

Actæon puncto-striata, Stimpson.

Shell small, white, elongated-oval; whorls five, the body whorl large, three-fourths the length of the shell; the surface of the upper whorls, and of the body whorl above the aperture, smooth; the lower half of the shell encircled by ten to fifteen revolving, deeply-cut lines, which are indented by minute punctures at regular distances; each whorl is flattened at the suture, which is deep and channeled; aperture narrow, two-thirds the length of the body whorl; outer lip sharp and regularly curved; inner lip thickened, with a distinct fold on the columella; umbilicus depressed, open in young specimens. Length one-tenth, breadth three-fortieths of an inch.

It was first discovered by Prof. C. B. Adams, in mud dredged in New Bedford Harbor, and described by him in *Journ. Bost. Soc. Nat. Hist.*, III., 323, 1840. Of the twenty-two species of Tornatella, known to us, our shell is the smallest yet found. I have taken a few specimens alive in dredging, and find recently living shells washed up on sandy shores, in shell sand and in heaps of seaweed thrown up beyond ordinary high tide. Inhabits from Cape Cod to South Carolina.

FAMILY 64. Cylichnidæ, contains three genera, all of which are represented in Rhode Island.

GENUS CYLICHNA, LOVEN.

This genus inhabits deep water generally, and its distribution is world-wide. There are forty species, two of which inhabit Rhode Island.

71. CYLICHNA ALBA, BROWN.

Syns.:

Volvaria alba, Brown, 1827.
Bulla triticea, Couth., 1838.
Bulla corticata, Möll., 1842.
Cylichna alba, Stimp., Dall., Tryon, etc.

Shell cylindrical, solid, smooth, of a dull white color, covered by a thin, rusty epidermis; surface with minute revolving lines and delicate lines of growth; spire none; in place of it is a circular pit, from the margin of which the lip takes its origin, rising a little, then passing downwards in a straight line, forming a long, narrow aperture; inner lip curved at the base, making the aperture at this point double its ordinary width. Length one-third, breadth one-tenth inch. Found in the maws of fishes caught in Massachusetts Bay (Gould); Maine (Mighels); Greenland (Mörch); Great Britain (Brown); from Block Island to the Arctic Ocean; northern coasts of Europe; northwest coast of America, south to Silka (Verrill). I have found one specimen in Narragansett Bay.

72. CYLICHNA ORYZA, TOTTEN.

Shell minute, white, glossy, largest in the middle and tapering at each end; spire depressed to a shallow pit; body whorl enveloping all the others; surface smooth; at each end are a few microscopical revolving lines; aperture long and narrow, wider at the base; resembles the previous species very much, except that it is shorter in proportion to its breadth. Length one-fifth, breadth one-tenth inch. It was first discovered by Colonel Totten, in Newport Harbor, and described by him in *Silliman's Journal*, XXVIII., p. 350. Afterwards found by Professor Adams in New Bedford Harbor in mud. Inhabits from Cape Cod to South Carolina. Not uncommon in Greenwich Bay at Apponaug in shell sand.

GENUS UTRICULUS, BROWN.

73. UTRICULUS CANALICULATUS, SAY.

Syns.:

Volvaria canaliculatus, Say, 1826.
Bullina canaliculata, Say, 1832.
Bulla canaliculata, Gould and DeKay.
Bulla obstricta, " "
Utriculus canaliculatus, Stimp., Dall.

Shell cylindrical, white, shining, covered with faint lines of growth; spire a little elevated, with a minute but prominent apex; whorls five, the summit of each having a shallow rounded groove; outer lip arching forward; inner lip enameled, with a small tooth on fold near the base. Length one-eighth, breadth one-tenth inch. Massachusetts Bay to South Carolina. We find it in Rhode Island on sandy beaches.

Another species. U. Gouldii, Couth., inhabits from Massachusetts Bay to Grand Manan.

GENUS DIAPHANA, BROWN, 1833.

Syns.:

Amphisphyra, Loven.

74. DIAPHANA DEBILIS, GOULD.

Shell small, obliquely-ovate, tumid, thin and brittle, greenish white; whorls four, all terminating on a level; body whorl the whole length of the shell, including all the others, and partially detached from them above; surface smooth; aperture the entire length of the shell, narrow at the spire and constantly widening to the base; outer lip slightly waved; inner lip covered with a thin coat of enamel, partly covering an umbilicus. Length one-tenth, breadth a little less. Cape Cod to the Arctic Ocean; northern coasts of Europe (Verrill). Stonington, Conn. (Linsley). Very rare south of Cape Cod. I have never seen one in our bay.

FAMILY 65. Bullidæ, contains three genera, one of which is represented in Rhode Island.

GENUS BULLA, LINNÆUS, 1759.

There are fifty species of Bulla, distributed all over the world, inhabiting sandy mud flats, slimy banks of river mouths, and brackish places. They are carnivorous, feeding on bivalves, and serving in their turn as food for fishes. There are three species in New England, but only one in Rhode Island.

75. BULLA SOLITARIA, SAY, 1822.

Syns.:

Bulla insculpta, Totten, 1835.

Shell oval, bluish white, fragile, the body whorl enveloping all the others and covered with numerous revolving minute and regular lines; spire depressed, invisible, sometimes opening in a small pit; aperture narrow at the top and broader at the base; outer lip sharp, thickened a little at the base, forming a slight fold at the umbilical region. Length one-third, breadth one-fourth inch. Say described this shell in the *Journ. Acad. Nat. Sc.*, *Phila.*, II., 245, from a solitary specimen found on the coast of Maryland, and supposed by him to be very rare. Col. J. G. Totten afterwards found shells at Newport, R. I., which he described in *Silliman's Journal*, XXVIII., p. 350, as Bulla insculpta. Gould and DeKay adopted his name in their works, but in Binney's Gould, second edition, Say's name was restored. The two species are now considered identical. Massachusetts Bay to South Carolina. Common in the muddy lagoons and salt ponds along the shores of Vineyard Sound, Buzzard's Bay, and Long Island Sound, (Verrill). I have dredged alive a few half-grown specimens in our bay. Over twenty years ago I found quite a number of dead, full-grown shells on the sand at Mark Rock, but have never been able to get any more since that time at that locality or elsewhere, until last summer (1885). One day last August I was informed that there were quantities of these shells on the shore at Camp White. I started the next day for the locality and, sure enough, there were thousands of them there, full-grown, but dead, and all cleaned out beautifully, and showing by their appearance to be very recently living. I gathered several hundreds of them, and the next day an unusually high tide swept away every trace of them from the shore, and since then not one has been seen. They inhabit mud flats covered with eel-grass, facing sandy shores, in one or two fathoms water. They are extremely fragile shells, and are seldom seen in cabinets in a perfect condition.

FAMILY 66. Aplustridæ.
" 67. Lophocercidæ.
" 68. Aplysiidæ.
" 69. Pleurobranchidæ.
" 70. Umbrellidæ, all absent from our fauna.

Order Nudibranchiata contains seven families, eleven sub-families, 108 genera, and over 600 species. These animals are all destitute of a shell, except in the embryo state, and although many species may inhabit our waters, on this account they are excluded from the shell-bearing mollusca of Rhode Island.

(To be continued.)

Color of Birds' Eyes.

Color of eyes of adult. Red-tailed Hawk, (observed in two living specimens), Straw.
Sharp-shinned Hawk, adult, red.
Sharp-shinned Hawk, young, straw.
American Golden Eye Duck, straw.
Pileated Woodpecker, straw.

DICKEY & ALLEN.

ON account of change in our business and pressure of work, this number is unavoidably delayed.

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The New Check-List.

WE are glad to learn, through the receipt of a circular from the American Ornithologists' Union, that the *New Check List and Code of Nomenclature of North American Birds*, is about to be presented to the public. This work, which will be of the highest character, representing as it does the almost incessant labor for two years of an able committee appointed by the Ornithologists' Union, will not find a place on the shelves of the naturalist's library, but will be constantly lying on his work-table close at hand. The treatment seems to us to be admirable. The first part is given up to the exposition of the rules of nomenclature, and the second gives not only a classified list of all the North American birds, but is synoptic in its character, giving the names of the higher groups. After each specific name references are given by which its original description can be found, and also appended to each is a brief statement of its habitat. That no confusion will be experienced in referring to previous check-lists those of Baird, Coues, and Ridgway are given in full in the concordance. Though the price ($3.00) may seem at first a little high, it should be remembered that a first-class work of such size and of limited sale, is of necessity expensive.

Work of the Government Entomological Division.

SINCE our last issue several yearly reports have been received, among which that of the United States Commissioner of Agriculture, which embraces a general sketch of the work done by the department during the past year, and that proposed for the ensuing is especially interesting and valuable.

The work done by the Entomological Division includes the publication of several bulletins which contain the results of a vast amount of investigation. That the labors of the board are of the highest practical value is admirably set forth by the commissioner, who thus writes:

"The importance of the study of economic entomology becomes every year more and more apparent. Scarcely an agricultural or horticultural meeting takes place but that the subject of injurious insects and the best means of counteracting their ravages occupy a large share of attention. The losses occasioned by destructive insects to the farmers of the country aggregate an enormous sum, and there are few directions in which the department can do more good than in researches having for their object the prevention of a portion of these immense losses. The valuable results already obtained in the work of the Entomological Division under its present efficient management are a sufficient promise of good work yet to be done.

The work of this division has greatly increased during the year, several new lines of investigation which promise valuable results having been entered upon.

The appearance of the so-called "seventeen-year locust" or periodical cicada, in May and June, over a large extent of country, enabled the entomologist to make many interesting investigations in regard to it, and a bulletin (No. 8 of the present series) was prepared and issued, giving a full account of the habits and life-history of the species, and a revised edition is being prepared.

Two other bulletins have been issued, one (No. 5) treating of certain parasites of injurious insects, and the other (No. 6) of the imported elm-leaf beetle. This last is a practical treatise of an insect that has of late years proved very injurious to the elms throughout the Eastern States, and shows clearly and plainly how it may be satisfactorily dealt with.

Destructive grasshoppers have been exceptionally abundant during the summer. One species (*Melanoplus destructor*), peculiar to the Pacific slope, has done much damage in California. and special study has been given to it on the spot.

Remembering the fearful devastation caused by the Rocky Mountain species between 1873 and 1877, the people of the West have felt very keen anxiety as to the future on account of the increased injury the present year. The entomologist has given this subject very careful attention, and, from the reports of special agents and a full consideration of the subject, he concludes that there is some danger of increase in the next two or three years should the weather prove favorable to the insect.

But as an encouraging offset to this rather gloomy prospect, he also considers that, under conditions the most favorable to grasshopper increase, the injury can never be as widespread as it has been in the past, owing to the advance and increase in settlement.

Other destructive insects have been very numerous, and a series of test experiments have been made by agents stationed in New Jersey, Indiana, and Iowa, with many insecticides which have been recommended but never thoroughly tested.

Another new field of investigation has been added to the division by the appropriation by the last Congress of $5,000 to be devoted to the promotion of economic ornithology, or to the study of the interrelation of birds and agriculture, an investigation of the food, habits, and migration of birds in relation to both insects and plants. I have commissioned Dr. C. Hart Merriam, the chairman of the committee on migration of the Ornithologist's Union, to act with the entomologist in this matter, and circulars have been prepared and sent out, and the work is now progressing in such a way as to promise solid and valuable results."

In the work of the Ornithologists' Union many of the readers of Random Notes are personally interested, and all will look forward to its results as presenting prime factors in the consideration of scientific agriculture.

A Convenient Method for Finding the Specific Gravity of Minerals.

The principal thing needed to determine the specific gravity of a mineral is an ordinary spiral spring; for quite large and heavy specimens a window-curtain spring will answer. The spring may be attached by a nail or wooden peg which has been driven in an upright piece of board of considerable length; care being taken to have the support long enough so that the mineral in hanging will not touch the board. The mineral is now fastened to the lower end of the spring by means of a string, a mark *a* having been previously made on the upright piece of board opposite to the lower end of the unstretched spring, the mineral is allowed to hang free and draw out the spring to its utmost. Now, on the upright, mark the position of the same portion of the spring as was before used in determining *a*, and call this second point *b*.

The distance from *a* to *b* will represent the weight of the object in air.

Now raise a vessel of water under the specimen so that it shall be wholly immersed and mark again on the upright the position of the lower end of the spring and mark it *c*.

The distance from *b* to *c* will represent the loss of weight in water.

Now we know that the specific gravity of a solid is equal to its weight in air divided by its loss of weight in water; therefore, the distance from *a* to *b* divided by the distance from *b* to *c* will give the specific gravity of the mineral in question.

Suppose, for example, we wish to find the specific gravity of a piece of Hematite. We first note the natural position of the spring, then attaching the specimen we note that the weight of the mineral has stretched the spring so that it extends five inches. Next, we bring up under the specimen a jar of water until the mineral is beneath the surface but not touching the sides or the bottom, and find that the spring has lost one inch of its length. Five, the weight in air, divided by one, the loss of weight in water, gives five as the specific gravity of Hematite.

If it is desired to operate with small fragments a more delicate spring must be used, and instead of each time tying the specimen to the spring, a small scale pan may be permanently attached. Instead of marking the positions of the spring, a permanent scale can be made on the upright board. In the Jolly Balance, of which this is only a modification, the scale is cut on the surface of an upright mirror.

The determination of the specific gravity is especially valuable in distinguishing ores of iron, copper. lead, etc., and though it may be roughly approximated by balancing in the hand, the method here described is convenient, easily understood, and if properly carried out will give a result which will answer for all practical purposes.

H. F. WALKER.

A Collecting Trip in the Magdalens.

ON alighting from the cars at Pictou Landing we are met by the captain of the iron packet "Beaver." The freight is soon on board and with the order to "cast off the bowline," we realize that we are soon to see the land of the Puffins, Gannets, and Razor Bills.

Late in the afternoon we touch at Georgetown, Prince Edward's Island, and later at Souris, after which the course is shaped for the Magdalens.

On the following morning we see the mountains and high cliffs of red sandstone. As we approach nearer we are struck by the fantastic forms which the actions of the elements have given to the coast. Here is a vast cave into whose dark mouth flies a Black Guillemot with a small fish for her young. Yonder is a high hill looking like a huge divided sugar-loaf, the side towards the sea being perpendicular from base to summit, a distance of 400 feet or more; midway, upon a narrow shelf, is a bunch of sticks whose nature is betrayed by the harsh croaks of a pair of ravens. On the shore of a small cape at the base of this hill is the store, and near by several story-and-a-half houses. By far the best accommodations are offered to strangers at the house of Louis Boudreault, mayor, etc., etc., of Grindstone.

The afternoon was spent in "getting the lay of the land." The islands are extremely hilly, and the greater portion is covered with a growth of stunted spruces, whose interwoven branches rival a chaparral thicket. In various parts of the islands are sloughs, which, although firm enough in appearance, would, to use my companion's description, "mire a web-footed ghost." In the midst of these sloughs the Rusty Grackle and Wilson's Snipe lay their eggs in safety. In the large slough on the east point of Grosse Isle Wild Geese are said to breed. Not a great variety of birds were to be found on Grindstone, so we determined to move to pastures new.

A visit to Shag Rock revealed the fact that nothing but Wilson's Terns and a few Black Guillemots are breeding there now. Mr. Maynard informs me that he once found Cormorants breeding there; but at that time the rock was almost inaccessible, though now it has been made easy of ascent by the action of the frost. We found that the waves had formed a large cave, the roof of which in a few years will fall in and again divide the island.

The natives told us, in answer to our inquiries concerning Bird Rocks, that the best thing to do was to go to Bryon Island and there wait a favorable day to go across to the noted rocks, about twelve miles distant. This we did; but the favorable day was not forthcoming. In the interval we thoroughly explored "the Bryon." This, in many respects peculiar island, has not a spring, and but a single well; rain-water is used for all purposes. The island is somewhat of a figure eight shape. On the east point a colony of Wilson's Terns have taken up their abode, and on the rocks around vast numbers of Kittiwakes sun themselves, contesting for their position with the Eider Ducks, which are in turn driven away by the seals.

On the northern side are colonies of Puffins and Razor Bills which deposit their eggs in natural clefts oftener than in holes of their own excavation; and in the debris which falls from the cliff are seen the nests of the Black Guillemot. The entrance to the nests is betrayed by the smoothness of the earth at the opening. In various parts of the island are found the burrows of the Leach's Petrel, and farther into the interior the Black Polled Warblers and Winter Wrens build. Several collectors, I am told, have taken nests of the Pigeon Hawk (Falco Columbairus) here. Numerous Red-Throated

Divers, Mergansers, and Surf Ducks were seen, also a pair of Harlequin Ducks, evidently having a nest on the island.

Having explored Bryon, our attention is directed to Bird Rocks. Many times did we turn our spy-glass there and plainly discern the white mantle of birds which covered them. It is very difficult to persuade a native to go to the rocks. Nothing will do it but an extravagant "insult" in the shape of hard cash. At last, angry and nettled by the delay, we determined "to go it alone." Securing an eighteen-year-old fisher boy, we start during a dead calm to row across. Arriving at the rock in the afternoon, we are cordially greeted by the light-keeper. The height of the rock has been much exaggerated by many writers. At its lowest point its height is 120 feet; the circumference is 700 yards; without a ladder the ascent of the larger rock would be well-nigh impossible, but the smaller rock, one-half mile distant, can be scaled by an expert climber.

The Gannets are probably the most interesting inhabitants. Wherever there was a shelf of sufficient width they were to be seen guarding their bunch of sea-weed, their single egg, or the naked young. The keeper said that he had collected the eggs from a particular shelf every day and that the Gannets there had ceased laying, but still guarded jealously their despoiled nests, if nests they might be called.

The Murres and Razor Bills are crowded upon the smaller ledges, and when they fly the eggs and young are pushed off. The young appear not to be injured by the fall, and some were noticed which fell fully 100 feet to the rocks beneath, to scamper to the water and swim out, only, however, to fall a prey to the voracious cod-fish which lie in wait for their prey with the persistency of sharks. In this instance the birds were about a week old.

The Kittiwakes build a neat nest under the overhanging crags, which is very difficult. The Puffins, now reduced to a small colony, occupy one corner of the top surface, making their burrows under the flat rocks, and sitting near the entrance gazing with curiosity at the intruder who comes to despoil their homes.

The birds are very tame and will allow a near approach.

The Murres' eggs are gathered by the light-keeper and placed in pickle for winter use. At that time he had thirteen barrels prepared and stowed away.

But darkness is overtaking us, and having gathered up the slain birds, we embark for the return, feeling well repaid for the aching muscles which the long row, together with five hours of climbing had caused, and with reckless indifference we stretched ourselves on the thwarts and surrendered to the embrace of Morpheus, and in our dreams the mournful cries of the Kittiwakes seemed to mingle. Suddenly, a loud "boat ahoy" breaks in rudely upon our slumbers, and we answer the hail of a fishing schooner drifting for salmon. Finding that a light breeze has risen we set the sail and arrive at Bryon about 3.30 A. M., the following morning.

As the mercenary result of our venture we had about seventy specimens of Murres, Gannets, Razor Bills, Puffins, Kittiwakes, and three half barrels of eggs (many of which however, contained embryos), while in our hearts we felt the satisfaction of an enterprise successfully accomplished.

G. W. F.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXIV.

SUB-CLASS PULMONTA.

THE animals of this third and last subclass of Gasteropoda, differ from all the previously described mollusca, principally in the fact that they are air-breathers. They have only the simplest form of a breathing apparatus lined with a net work of respiratory vessels. The sexes are united in each individual. Most of the species have a shell large enough to contain the animal, some have a shell only to cover a portion of the body, and a few have none. The Pulmonata are divided into two orders, viz.: Stylommatophora and Basommatophora. These are further sub-divided into sub-orders, groups, families, sub-families, genera, sub-genera, sections, sub-sections, species, and varieties. These finer sub-divisions are of no particular importance, except as a convenient method of grouping and arranging a large collection, and only serve to confuse the student. They will be omitted in these papers. Those readers who wish to know all these finer sub-divisions are referred to *Tryon's Structural and Systematic Conchology*, published by the author at the Academy Natural Science, corner 19th and Race Streets, Philadelphia.

ORDER STYLOMMATOPHORA.

Terrestrial mollusks having four tentacles, the superior pair retractile, and having eyes at their extremities. This order contains nineteen families.

Family Testacellidæ, four genera and forty-five species, all absent from *North America*.

Family Oleacinidæ, four genera and over two hundred species, all absent from *New England*. A few species inhabit the *Southern United States*. Mostly found in *Tropical America, North and South Mexico and West Indies*.

Family Streptaxidæ, three genera, about two hundred species, all foreign.

Family Helicoidea, seven genera, seventy-five species, all foreign.

Family Vitrinidæ, sixteen genera, over two hundred species; of these two genera are represented in *America*, viz.: Vitrinozonites, W. G. Binney, contains one species, *V. Lattissimus*, Lewis, *mountains of Western North Carolina and East Tennessee*, and Vitrina, Drap, eighty species, three of which inhabit *America*, one from *California to Utah southward to New Mexico*, one in *Greenland* and *Labrador*, and one in *Canada* and *from Maine to Michigan*.

Family Zonitidæ contains two genera, Zonites and Nanina. Nanina is divided into twenty-seven sub-genera and over five hundred species, inhabiting in tropical and sub-tropical regions of *Asia*, *Africa* and *Oceanica*. Zonites is divided into twenty-seven sub-genera, twelve of which inhabit the *United States*, and five are found in *Rhode Island*, viz.: Hyalinia, Conulus, Helicodiscus, Striatura, and Punctum.

76. ZONITES (HYALINIA) ARBOREA, SAY.

Syns :

Helix arborea, Say, Binn., Eatton, Gld., DeKay, Ad., Pfr., Chem., and C. Hyalinia arborea, Morse, Tryon, W. G. Binney.

This shell was discovered by Thomas Say, and described in *Nichols' Encyclopædia*, 1816, as Helix arboreus: "Shell very thin, fragile, repressed, horn color, pellucid very little convex; whorls four, irregularly wrinkled across; aperture sub-lunated. lip thin, brittle, junction with the body whorl acute; umbilicus large and deep. Length one-tenth of an inch nearly." Either Mr. Say or the printer made a mistake. It measures one-quarter of an inch in diameter. Morse's description says, "umbilicus not large, whorls four to five."

This shell is not remarkable for its beauty, and is not of particular interest. It is extremely common, found about decaying stumps and old logs under the bark. It is very simple in structure, and would at once be recognized by any person who had ever seen it. Its range is very great, being found from Labrador to Florida; from Great Salt Lake to Texas; in California, Montana, Nevada and New Mexico. It is also said to have been found in Cuba and Guadaloupe.

77. ZONITES (HYALINIA) BINNEYANA MORSE.

This shell was discovered in Maine, by Mr. E. S. Morse, and named by him Helix Binneyana. It was described in the journal of the Portland Society Natural History: "Shell minute, whorls four; spire slightly elevated, pellucid, nearly colorless; aperture well rounded; umbilicus open." It is quite a rare shell. It has been found in Maine, Massachusetts and at Tawas Bay, Mich. I have found a few in Rhode Island, but perhaps its range is greater than is now suspected and future observers may find it to inhabit a greater extent of territory than is now accredited to it. It resembles arborea a little, but is smaller (one-sixth of an inch in diameter) and differs in color, being of a greenish white tint.

78. ZONITES (HYALINIA) CELLARIA, MLÜLER.

This shell is not a native of this country but has become naturalized by a residence of over fifty years. It is an European species, very common in Great Britain, France, and Germany. The following description is taken from Reeve's *British Land and Fresh Water Mollusks*, page 47: "Shell rather narrowly, deeply umbilicated, depressly orbicular, greenish-yellow, pale, very glossy; spire convexly flattened; sutures linearly channelled; whorls six, narrow, increasing slowly, longitudinally obscurely plicately striate; aperture obliquely lunar." It was first noticed by Müller in 1774 and named by him Helix cellaria. Reeve calls it Zonites cellarius. It has been described by many other authors in Europe under twelve different names.

Mr. G. Ord, of Philadelphia, found the first specimen in America, and gave it to Mr. Say, who described it as a new species under the name of Helix glaphyra. It has since been found in old, damp cellars in Boston, Lynn, Salem, Marblehead, Portland, Halifax and other sea port towns, and was supposed to have been imported into this country on wine casks or other merchandise. On comparison with the English shells, they were found to be identical. I found them twenty years ago in two old cellars in Pawtucket, in the boat-house of Mr. G. L. Spencer, in Pawtucket, and in several cellars on Canal Street in Providence.

On Broadway, in this city, there is a large greenhouse, or rather several of them together, owned by Mr. Robert Hogg; in these greenhouses at all times of the year, can be collected quantities of these shells. In this warm and damp atmosphere these animals propagate and grow rapidly and unlike other snails do not hybernate six or seven months in the year. These snails are very destructive to the young plants and are regarded by Mr. Hogg as a nuisance. If any of our readers are anxious to collect this species under their best conditions, alive and of all sizes, I will guarantee that if they present themselves at Mr. Hogg's door and say they wish to get some snails, he will come up smiling every time and invite you to come in and pick up all you want, and if he has time will help to fill you up and rid his place of the nuisance.

Mr. Morse, in speaking of this species in the *American Naturalist*, says: "A lady in Portland, in whose cellar the writer collected many, stated that the snails annoyed her by crawling into her milk pans.

[*To be continued.*]

The Native Trees of Rhode Island.

No. IX.

BY L. W. RUSSELL.

Quercus ilicifolia—Scrub Oak—Bear Oak.

The common occurrence of the *Quercus ilicifolia*, scrub oak or bear oak, in Rhode Island, indicates a corresponding prevalence of poor soil. It will grow in mere sand or gravel, or wherever it can get a foothold among thinly-covered ledges of rock. While the primitive forests yet remained, this little oak chiefly grew, no doubt, as an undergrowth; and even now, in existing wood lots, hundreds of these shrubs may frequently be counted upon an acre of ground, ready to take full possession as soon as the larger wood is cut off. Their growth is particularly noticeable in pine woods and among the gray birches. The fact of the scrub oak following the pine when the latter is removed is often spoken of as though it were a strange thing, but this is easily accounted for. The squirrels have been the seed-planters. A careful observer will find these oaks plentifully scattered about among the pines, or other trees. The soil has become exhausted of the material essential to the larger growth. This hardy oak is ready to cover the ground as a kind of fallow crop. It springs up, and, in a few years, makes an almost impenetrable bush. Worthless as fuel, except where wood is scarce, it has its use. It prevents the winds from making sand-heaps of poor soils. These shrubs frequently, in a natural way, protect trees of tender growth until they get sufficiently established to take care of themselves. Man could do better with them, and, indeed, has successfully utilized them in this way: They have been planted in rows as nurses to other trees which needed protection, the latter being planted a few years later in the vacant places. Another way is suggested: Cut lanes, a few feet wide, in existing areas of this shrub, planting pine or other seeds in the spaces; the oaks would thus act as a protection from wind and weather until the seedlings were well started.

In the diluvial drift and ridges around

Providence and further down the bay, also in the southern part of the State, the scrub oak readily takes possession of the soil. With it, in some localities, is found the still smaller chinquipin oak, and, with both, oftentimes, the gray birch and pitch pine. I suppose that the only reason why we do not find it as the principal growth in better soils, is that trees of a larger growth overrun them, keeping them if they survive at all, as an almost unnoticeable undergrowth.

The general appearance of the scrub oak is very familiar. It is the smallest of the native "biennials," usually not growing more than eight feet high, but having several stems from a single root, giving it, where it has a chance to spread, a very bushy appearance. The main stems are of a dark, rich green, beautifully varied with light, pearly dots and patches, the whole being shiny, as though varnished, and often prettily adorned with lichens. The young branches are of a light ashen gray, gradually taking the greenish hue of the stem, the extreme ends being velvety. The branches are numerous and very scraggy, well adapting the shrub to hedging purposes, for which it is sometimes used.

The blossoms appear in May and are very pretty objects. The sterile ones come from the axils of the last year leaves and hang in jaunty clusters, changing to various colors from orange to red. The fertile flowers are in the axils of the new and leaves are nearly sessile and inconspicuous.

The average typical leaf is about two and one-half inches long, two-thirds as wide on petioles often very short, but sometimes three-fourths the length of the leaf.

The fruit is very abundant and of good size for a shrub. It is often beautifully striped longitudinally and set in a neat, closely imbricated cup, christening the last year's branches in such profusion they form a striking appearance. The kernel is of a deep orange as is the base of the acorn when it is attached to the cup. The name "bear" oak is due to the fact that bears are fond of the acorns. Swine also feed upon them.

There is a well marked variety of this oak in the state growing fifteen to twenty feet high and six inches in diameter.

(To be continued.)

Reptiles and Batrachians of Rhode Island.

BY HERMAN C. BUMPUS.

Number XVI.

4. *Rana palustris* Le Conte. The Marsh or Pickerel Frog is perhaps our most abundant batrachian, being found in nearly every small body of water and not infrequently taking up its abode in springs and surface drains.

Le Conte, in giving the original description of this animal, applied the specific title of *palustris*, thus characterizing it as an inhabitant of the salt marshes. Though often found in this locality, and being indeed the only native batrachian which is known to voluntarily take to salt or brackish water, the Marsh Frog is by no means restricted in its distribution, nor is it limited to the coast alone. Specimens have been seen by Dr. Holbrook in the White Mountains while the National Museum contains types from Wisconsin and various localities along the Mississippi as far south as the Mexican Gulf.

Though at first glance the Marsh Frog resembles the following species, the resemblance is only superficial and it is remarkable that the animal's identity should not have been made out until the description of Le Conte. Not only does *Rana palustris* differ from *Rana halecina* in coloring, having the spots of the back of a rectangular outline, arranged in four rows and of a deep brownish or black shade, but it presents several structural peculiarities. The cuticular folds of the back are less prominent and the snout is less pointed. The animal, moreover, is said to have a strong and not altogether pleasing odor. The young are described as being of a yellowish gold color, though I have not noticed that the young differ materially from the adults.

This frog is most loath to retire on the approach of winter and can often be found after the other Ranidæ have retired. I have often, on warm days in winter, seen this species as it made its way over the dead leaves at the bottom of some spring, possibly looking for a warm niche into which it might retire on the return of cold weather.

Being our most abundant frog and obtainable at almost all seasons of the year, it has come into good repute with the fresh-water angler, and is often, as a whole or in parts, used as a bait for the omnivorous pickerel. It is thus often spoken of as the Pickerel Frog, an appellation which it has in common with its more elegant congener, *Rana halecina*. The Marsh Frog often grows to a considerable size, the body alone sometimes measuring three inches in length, while the legs often exceed four inches.

Vorticella, or the Bell Animalcule.

In those who have interested themselves in observing the more minute creations of nature, few objects have awakened more admiration or wonder than a colony of these active Protozoans, or single-celled animals. Though a most familiar object, it is quite possible that there are not a few of the younger readers of Random Notes to whom a short description of the manner in which the animal may be captured, and a few words on its structure and habits will not be wholly lost.

If the weeds and stones of a spring or clear brook be scraped with a fine net, and the result be washed out in a jar of fresh water, in a few days there will be observed, on the sides of the vessel, several white, moss-like growths which sway back and forth as the water is disturbed, but which immediately disappear on being touched with some object, as the point of a pencil. If one of these growths be now examined with a hand lens, by looking through the side of the jar, there will be observed what strikingly resembles a bunch of toy balloons — a colony of vorticellæ. Now if the entire bunch be removed from its support, by passing a knife blade beneath it, and placed on a glass slide with a small quantity of water and covered with a thin cover glass, in such a way as to exclude any large air-bubbles, many important points can be made out.

There will first be noticed a main stem in which is a striated elastic cord, which, by contracting, draws the bunch of vorticellæ toward what was once its attachment. The distal end of this stem branches into numerous sub-divisions, each of which, in structure, resembles the main stem and bears at its extremity a bell-like expansion — the vorticella proper. By watching the contractions of these stems and branches, it will be noticed that the power of volition seems to reside in each individual, for while one portion of the colony may contract on being irritated, another portion will remain expanded and active. On all being disturbed the main stem contracts, drawing the entire colony to the surface of the support on which it grows.

Each bell, in its extended condition, is seen to have a flaring margin which is lined with a row of cilia whose motion induces a fresh current of water to be constantly flowing by and among the animals, from which they seize the nutritive particles.

On viewing the object, a single individual bell, with a higher power, the ciliated margin is seen to be partially covered by a disk, the *epistome*, which is also along its rim provided with cilia. If the single individual be now more closely examined, it will be noticed that the disk is raised upon one side and that particles from the water are constantly entering and leaving the organism at this place, the *vestibule*, which thus functionizes as the mouth.

Particles once entering the vestibule can be followed as they are taken further and further into the body of the animal and finally, having all nutritive matter digested from them, they are thrown out from the same door which they entered.

If it is desired to further examine the digestive apparatus, a simple method is to induce the animal to accept as food some coloring matter, as powdered carmine. This, when being taken into the vestibule, will beautifully illustrate the action of the cilia, and as it fills up the digestive tract, will map out its outline in a most beautiful manner. H. Karey.

Immaculate Eggs of Song Sparrows.— An item that interests me is the finding of a set of Song Sparrows ¼ in my garden, the eggs being almost entirely without any markings whatever — only one of the set being noticeably spotted; they closely resembled eggs of Blue Bird; pale bluish tint. — J. N. Clark.

Ninety Geological and Zoological Slides. Original cost 75 cents to $1.00 each. Price for the lot, $30.00. List furnished. Address A. A. Tenney, Williamstown, Mass.

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To a Friend at West Point.

"PROSE OR WORSE," BY W. W. BAILEY.

The brave little Dutchmen
  Are all in their place,
And safe in the care
  Of my Wardian case,
Their "breeches" all packed
  For the winter away
I hope to coax out
  On some sunshiny day.
What will they imagine
  When they shall awake
From their short winter nap,
  With a yawn and a shake
To find themselves blooming
  Down here by the shore,
In the city of Roger
  With Yankees — *galore*
"In my minds eye, Horatio,"
  The spot I recall,
Where they grow in the Highlands
  By a wee water-fall,
That only in spring-time
  Leaps over the rocks
Near the bend of "Flirtation"
  At Battery Knox.
There often in childhood
  I wandered to see,
The first of the season,
  Myself, and the bee!
How lovely appeared then
  Their foliage of lace,
And creamy white trousers,
  Each one in its place;
And then I think, too,
  And you know, I suppose,
Where, far down the cliff,
  The dog violet grows.
I see the "herb Robert"
  All dripping with dew,
And scent its rank fragrance
  As I used to do.
Just here a path perilous
  Led to an isle
Called "Duck" by the vulgar;
  Methinks I should smile
To see myself scrambling
  Once more down the way
That once was so easy
  On half holiday.
"Backward, turn backward
  O, time, in your flight,"
I seem to be dreaming
  Of childhood to-night;
And many a picture
  I gladly review
As I pen these poor verses
  In answer to you.
West Point! what a word
  To unravel the chain
Of lingering thoughts
  I have stored in my brain.
I thread Stony Lonesome
  Once more with my friend,
In beds of the walking fern
  Pause to unbend,
Or sit 'neath the boulder
  Where Drake's "Culprit Fay,"
Once wandered alone
  With a fair mortal may.
But oftener I seem
  In my fancy to roam
About the loved hills
  That encircled my home.
And one there is always
  Who walks by my side,
The genial, the gentle,
  My father, my guide,
Who knew every plant
  On those wonderful hills,
And read the sweet music
  Of woods and of rills;
Who told the strange story
  Of pebbles that rolled
From far away Shawangunk
  In ice days of old;
Who led my young fancy
  To seek and to know,
Whatever of beauty
  The forests can show,
To him every trifle
  Some lesson conveyed
And mysteries whispered
"Oh, be not afraid!
For the Mittella's star,
  Or the green mantling scum
Of a pool, were still calling
  Their lover to come."
Ah, who is there like him,
  This friend of my youth,
Who prized above all things
  The beauty of truth?
Bloom fair o'er his grave
  Ye bright blossoms of May,
And breathe out your sweetness
  For many a day,
And Crow's Nest, look down
  On the lover who kenned
Each blossom you own
  As his personal friend.

With the exception of one week in January, the weather has been mild. The flocks of snow buntings that usually arrive along with our first heavy snows have not yet put in an appearance. We have not heard of the capture in Rhode Island of any Snow Owls, any uncommon species, or any unusual number of the commoner kinds, a marked contrast to the winters of 1883 and 1884, when Barred Owls, Pine Grosbeaks, and Brunnich's Guillemots abounded.

It is with much regret that we have to announce the recent death of Prof. Charles

E. Hamlin, who has for several years had charge of the conchological department in the Agassiz Museum of Comparative Anatomy at Cambridge. We hold in grateful memory the kind attentions we have received while making studies in his department.

WE are informed that the very fine collections of birds' eggs in the cabinet of the late John Snowdon Howland, of Newport, R. I., was bequeathed by him to New Haven, where it will be sent as soon as it can be properly packed for transporation.

Diamonds found in the United States.

WE are indebted to the author, Mr. George F. Kunz, for the pamphlet on precious stones, an abstract from the *Mineral Resources of the United States* containing much valuable and interesting material. From its pages we quote, regarding United States diamonds:

"About the first of the year 1855, a laborer in Manchester, Va., found a diamond in some earth he was digging up. It was put into a furnace for melting iron, at Richmond, where it remained at red heat for two hours and twenty minutes. It was then found to be uninjured and brighter than ever. It was valued in Richmond at $4,000 and became the property of Capt. Samuel W. Dewey, who called it Oninoor, or "Sun of Light"; it was later cut by Mr. H. D. Morse, at an expense of $1,500. The cutting reduced the weight from 23¾ carats to $11\frac{11}{16}$ carats. It is off color and imperfect, and is to-day worth not more than $400.

"The first diamond found in North Carolina was an octahedron valued at $100, at the ford of Brindletown Creek, by Dr. F. M. Stephenson. Another was found in the same neighborhood; and a third, a distorted hexoctahedron, yellowish in color, at Twitty's Mine, Rutherford County. A fourth, greenish in color, was found by Dr. T. C. Hunter, near Cottage House, Lincoln County, in 1852. Another, said to be a perfect crystal of white color, was found at Todd's Branch, Mecklenburg County. Dr. Genth reports two diamonds from Portis Mine, Franklin County, and others weighing from one-half a carat to over two carats, are reported from J. C. Mill's Mines, in Burke County. These diamonds are usually associated with gold, monazite, zircon, ochahedrite, etc., the débris of gneissoid rocks, in which graphite is always found.

"Several stones of fine quality have been found at the Horshaw placer gold mine, White County, Georgia."

Mr. C. G. Yale, furnishes the following notes on the California occurrences:

"For more than thirty years the placer miners have occasionally picked up small diamonds. The hydraulic washings at Cherokee, Butte County, have been the most prolific. The diamonds are usually found by the miners when cleaning up their sluices, or while washing off the bed rock, though in a few instances they have been picked up on the surface. As a general thing, the gravel in which they occur is mixed with lava, ashes, or other volcanic matter; zircon, platinum, iridium, magnetite, etc., being associated. While many of these stones have been of good color, brilliant and perfect, none weighing over 3¼ carats have been found in the state. So far as known, $500 is the highest price for which any rough stone has been sold; large numbers have found purchasers at from $10 to $50, and not a few as high as $100.

"The stones have been white, yellow, straw and rose, and many of good water. A few small diamonds have been found in the placer diggings of Idaho, of about the same quality, and occurring under the same conditions as in California.

"A stone weighing 15 carats was reported as found at Eagle, Waukesha County, Wis., having been thrown out at a depth of sixty feet while excavating a well. It is slightly off color and worth about $300 as a diamond, but is held at $1,000, owing to its being the first diamond found in Wisconsin; two small stones are also reported as found there, each weighing less than half a carat.

"In the latter part of 1883, a diamond was reported as found at Nelson Hill, near Blackfoot, Deer Lodge County, Mon. This was a colorless stone, in weight about 12 grains.

"Mr. J. D. Yerrington, of New York, reports a brown diamond, found near Philadelphus, Ariz. It weighed one carat, and when cut yielded a gem of one-half carat. Two pieces of blue glass, that had been rolled so as to lose all form, were naturally supposed by the finder to be. sapphires, being in the same locality with the diamond.

"One of the minerals most likely to be mistaken for the diamond, is a form of small quartz crystal, found principally at Santa Fé and Gallup, N. M., Fort Defiance, Ariz., Deadwood, Dak., and Shell Creek, Nev.

On the Breeding Habits of the Red-Shouldered Hawk.

THIS beautiful bird, familiarly known in southern New England as the Hen Hawk, is quite an abundant resident throughout the year. It is a very noisy bird, especially during the mating season, a favorite pastime then being to sail high up in the air in large circles, uttering its cry; I have seen a number of these birds so far up in the heavens that they looked as small as swallows, yet their cry could be heard very plainly.

Its food consists of small birds, rabbits, squirrels, etc., and occasionally chickens, the latter obtained from the poultry yard of some farm.

It breeds usually in deep, dark, swampy woods, and the naturalist might do considerable hunting and not be able to find its nest. One that I found April 16, 1884, was placed in the confluence of two main limbs of a maple tree in swampy woods; it was made of sticks, twigs, and sods; the cavity for the eggs was lined with cedar and grapevine bark and but slightly hollowed, the nest contained enough material to fill a bushel basket. As I approached the tree in which the nest was built, the setting bird silently left it, and sailing high up in the air, intently watched me as I climbed to the nest. Soon she was joined by her mate, who made his presence known by uttering his harsh ka-hee, ka-hee ka-hee.

I find, as a rule, that if the nest is inhabited, the ground near the bottom of the tree, and the bushes near by, will have a number of small feathers on and about them.

On a nest that I found April 25, this season, the bird staid until I began to ascend the tree; but usually she will leave before the tree in which the nest is placed is reached.

The nest, the description of which is given above, contained four fresh eggs; the dimensions are as follows: 2.15x1.63; 2.11x1.65; 2.09x1.62; 2.06x1.62 inches.

The eggs vary greatly both in size and color of markings. I have specimens, the ground color being light greenish white with scarcely any markings, others so thickly covered with dark brownish blotches as to nearly hide the surface color of the egg. The largest specimen I have, measures 2.23 x 1.75 inches; the smallest, 2 x 1.60 inches.

The Native Trees of Rhode Island.

No. X.

BY L. W. RUSSELL.

THE OAKS—*Quercus*.

THE following comprehensive view of the oaks of Rhode Island is presented as matter which may serve as convenient for reference and identification:

1. *The Annuals.*—Those which grow and mature their fruit during the first season.
    - *Q. rubra*—Red oak.
    - *Q. tinctoria*—Black oak. Yellow-bark.
    - *Q. coccinea*—Scarlet oak.
    - *Q. palustris*—Pin oak.
    - *Q. illicifolia*—Scrub oak. Bear oak.
2. *The Biennials.*—Those which do not mature their fruit until the second season, or eighteen months from blossoming.
    - a —*The White oak division.*
        - *Q. alba*—White oak.
        - *Q. obtusiloba* Post oak.
    - b —*The Chestnut oak division.*
        - *Q.—Prinus.*
            - *Var. bicolor*—Swamp chestnut oak.
            - *Var. monticola*—Rock chestnut oak.
            - *Var. prinoides*—Chinquipin oak.
            - *Var.* (not named).

The "annuals" are characterized not only by the ripening of the acorns during the first season, but by the lobes of the leaves being terminated by a bristly point or *mucro*. The lobes of the leaves of the "biennials" are rounded, and destitute of the bristly point. The leaves of the White oak division of the "biennials" have deep sinuses and correspondingly prominent lobes, while those of the Chestnut oak division have prominent teeth, resembling the leaf of the chestnut tree, but the teeth being more rounded.

A few of the prominent characteristics of the several kinds of the above trees are arranged below:

Q. *rubra*. Red oak.—Large tree; massive trunk, bark smooth until old, wood porous, inferior; leaves oblong or lance shaped, not deeply cut, contracted at base, lobes five or six on a side, terminated by bristles; acorns large, in a broad shallow cup, covered with thin, close scales; grows rapidly, sprouts readily from the stump; rare in Rhode Island; comes to perfection farther north.

Q. *tinctoria*. Black oak. Yellow-bark. —Large, handsome tree; rough thick bark, yellow inside, very bitter; leaves on long footstalks, yellowish green, inversely egg-shaped, deeply cut on mature trees, very shining above, three or four lobes on each side, mucronate, rich russet yellow in the autumn; acorn small, rounded, finely striated by dark brown stripes, meat yellow, very bitter, in a deep cup, diminishing downwards, scales free at extremity, upper ones somewhat fringed, abundant; wood porous, inferior as fuel, fair timber in dry situations; very common in Rhode Island, beautiful as a shade tree.

Q. *coccinea*. Scarlet oak.—Fine symmetrical tree, large size, rather slender limbs; bark rough, numerous short clefts, reddish gray color; leaves very deeply cut, on long slender petioles, very shining on both sides, roundish or oblong in general outline, bristle pointed, rich scarlet or crimson in autumn acorn small, globose, in a deep cup, lengthened at base, abrupt at upper edge, kernel white, slightly bitter; wood very porous, inferior as fuel, handsome in cabinet work; tree common in Rhode Island, but less so than Q. *tinctoria* a fine shade tree.

Q. *palustris*. Pin oak.—A tree of middle size in Rhode Island, the northern limit of the species, limbs slender; most graceful of northern oaks; leaves small on slender footstalks, polished on both sides, cut almost to the midrib, thin, somewhat drooping; acorns very small, not abundant, cup covering half the fruit, close scales; tree grows by the side of streams or ponds; has somewhat of weeping habit over a stream; rare in Rhode Island.

Q. *illicifolia*. Scrub oak. Bear oak.—A shrub, six to fifteen feet high, several stalks from a single root, scraggy branches; leaves small, on short footstalks, not deeply cut, two or three lobes with short bristly points; acorns small, beautifully striped, kernel deep yellow, same color where attached to the cup, very abundant; wood hard and tough; common upon the poor soils of Rhode Island.

Q. *alba*. White oak.—The most massive of native oaks, wide spreading, limbs low, large, and often crooked, lower ones horizontal, upper ones at sharp angles, bark gray or ash color, often in scales thick on old trees; leaves on short footstalks, four to six inches long, half as wide, upper surface lively green, lower surface pale, thick, leathery, deeply divided into lobes, three or four on a side, which are rounded or obtuse, and like all the "annuals," destitute of *mucros;* acorns long, average one inch, ovoid, in a shallow, flattened hemispherical cup, grayish, rough with roundish tubercles, on footstalks, single or in pairs, sweet and edible, not often abundant; wood tough, compact, elastic, very valuable for timber or fuel. The grandest tree of the New England forests; common in Rhode Island woods, although few finely developed specimens are seen.

Q. *obtusiloba*. Post oak.—Fine low-spreading tree in Rhode Island, branches numerous, very crooked and crowded near the trunk; foliage very dense, thick, leathery, shining above a deep sinus on each side, three broad divergent lobes above, and leaves arranged close together in stillated form; acorns on short footstalks, small, sweet, in a grayish, broad cup, smooth, close scales, often two, three, or four acorns together; wood valuable for posts, ship timber, etc.; tree very rare in Rhode Island.

Q. *prinus var. bicolor*. Swamp White oak.—A middle-sized tree, cylinderical head, scraggy branches, bark in long, loose scales, leaves obovate, narrowed at base into short footstalk, margin wavy, toothed, thirteen divisions, downy underneath, dark green above, six to seven inches long, half as broad, smaller leaves below the larger ones, fewer teeth; fruit large, roundish-ovate; acorns pointed, in deep hemispherical cups, rough outside, sometimes fringed on the margin, sweet, not abundant; heart-wood dark, sap-wood light in color, heavy, tough, strong, durable; a wet ground or swamp tree found in various parts of the state, but usually scattered, extremely variable.

Var. monticola. Rock Chestnut oak.—Middle-sized tree, not common in Rhode Island, habitant of rocky hills, bark reddish gray, compact, divided by long clefts but not deep; leaves four to nine inches long, two to five wide, on short footstalks, margin round-toothed, six to thirteen divisions, parallel veins, the whole resembling a chestnut leaf; acorns large, sweet, not abundant; wood valuable for fuel or timber; a fine tree when well developed.

Var. chinquipin.—Shrub, ovate, four to six feet high, several stems form a single root, bark ashen gray, bitter, somewhat cleft, with a few thin scales, leaves small, obovate narrowed at base into a short petiole margin, wavy-toothed or nearly entire, polished above, fine downy beneath; fruit small, on half inch footstalks, from leaf axils, middle of new shoots, orbiculars, in a neat tubercled cup; sandy plains, gravelly hills, and among ledges; not very common.

Var. unnamed. (See Art. No. IV., Vol. II., RANDOM NOTES)

NOTE. There are some variations of the oak family in this state, not specially alluded to in the above articles, but which may be treated of in future numbers. The oaks are seen to be abundant in Rhode Island, and really form the most important class of indigenous trees.

(To be continued.)

Reptiles and Batrachians of Rhode Island.

BY HERMAN C. BUMPUS.

NUMBER XVII.

5. *Rana halecina* Kalm. The Shad or Leopard Frog is at once the most beautiful as well as the most elegant native representative of the genus. Above it is of a green or yellowish metallic color and marked with two longitudinal rows of large, irregularly shaped, dark brown or black blotches which are bordered with a halo-like margin of a greenish shade. The arrangement into rows is often more or less broken up and the blotches may be small and numerous, or they may be of such a size as to extend from fold to fold of the skin. Below, the animal is ordinarily of a pearly white shade, though yellowish or gray cloudings may appear, according to the temperament or surroundings of the animal. The cuticular folds are very prominent and of a bright yellow color.

This animal has always attracted more or less interest since its first mention by Catesby, though it was not specifically described until met with by the Swedish traveler Kalm, who noticed that it made its appearance along the Delaware at the same time as the shad, and he hence named it *Rana halecina* from *halec*, the Indian name of shad.

The Shad Frog prefers rather the moist meadow land to the sands and rocks and is often surprised by the naturalist as he wanders through the swamps or low open pastures. When thus startled the frog will excitedly jump about, not infrequently, in its bewilderment, approaching rather than fleeing from the object of its fright. These leaps, when compared with the length of the animal, are enormous. A Shad Frog measures about seven inches in length and often jumps a distance of eight feet. Were a man to leap a relative distance he would clear the widest street at a bound or lightly spring to the roof of any ordinary building.

In its geographical distribution *Rana halecina* is found from New Mexico to New Brunswick, and from Minnesota to Florida and is generally abundant, representing in America the *Rana esculenta* of Europe.

Of the breeding habits of this species it may be of interest to note that the time of oviposition is remarkably late, specimens being not infrequently found still interested in their domestic duties long after the other species have left the breeding ponds. Mr. J. A. Allen makes note of having found, on dissection, apparently immature eggs as late as April 23.

With the Shad Frog our treatment of the native Anurous Batrachians is concluded.

WE are having some cold weather here, but it is only for a day or two at a time. Prairie Dogs have not laid up at all this winter; they are to be seen every day. Meadow Larks and Red Shouldered Blackbirds stay in this locality every winter, as also Mallard Ducks and Canada Geese.

W. G. S.

LARIMER CO., COLORADO.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXV.

79. ZONITES (HYALINIA) ELECTRINA, GOULD.

THIS little shell was first found by Mr. T. J. Whittemore, on the borders of Fresh Pond, in Cambridge, Mass., and was described by Dr. A. A. Gould, in the *Jour. Bost. Soc. Nat. Hist.*, III., 1840, under the name of Helix electrina, viz.: "Shell small, depressed, pellucid, fragile, amber colored; whorls four, conspicuously wrinkled by the lines of growth; aperture rounded; lip simple; umbilicated."

The shell is *not* amber colored, as in Gould's description, but smoky horn color, and when the animal is living in it, the shell appears almost black. The three species, arborea, electrina, and indentata, can hardly be distinguished apart by a beginner in the science. At first, when collecting these species, I could never identify them, until, arriving at home, I could compare them with typical specimens. By a close examination of full grown specimens of the three species together, the following differences will be noticed: electrina has three and one-half whorls, indentata has four, and arborea has four and one-half to five. In arborea, the whorls increase slowly and regularly; in electrina, the last, or body whorl, enlarges rapidly in size, in which respect it resembles indentata; but the most apparent difference between arborea and electrina is in the color of the shell as well as of the animal, and its more shining appearance; its umbilicus too, is a little smaller and its habitat is unlike either of the others, being found only in very moist places, under leaves, in fact, preferring low, swampy ground. The differences between this species and indentata will be given under the description of indentata.

It is found everywhere in the United States, east of the Mississippi River. F. A. Sampson quotes it from Pettis Co., Missouri, in the *Bulletin of the Sedalia Nat. Hist. Soc., August*, 1885. Binney refers this species to Helix viridula, Menke, thus making it an European as well as an American shell. Many conchologists are of this opinion, and the shell is called viridula full as often as it is electrina. Helix viridula, Menke, is one of the synonyms of Zonites radiatulus, Reeve, and as I have carefully examined and compared our shells with the English radiatulus, I am satisfied that they are not identical, and that electrina, Gld. is its proper specific name.

80. ZONITES (HYALINIA) INDENTATA, SAY.

This species was discovered by Say, and described in June, 1822, in the *Jour. Ac. Sci. Phila.*, II., 372: "Shell depressed, pellucid, highly polished; whorls four, with regular distinct impressed lines across, of which there are about twenty-eight to the body whorl, all extending to the base; aperture rather large; lip simple; umbilicus none, but the umbilical region is deeply indented." It inhabits the same range with arborea, and is found in company with it, under decaying leaves and also under stones. It is about the same size as arborea, but is distinguished from it by being lighter in color, in being polished, in having one whorl less, and in the rapid enlargement of the body whorl. It is distinguished from electrina by the absence of an umbilicus, by the color (indentata being whitish and sometimes tinged with pink, while electrina is smoky), and by the lines being remote, while they are crowded in the other species; and from all other shells of this genus, by the microscopic impressed lines radiating from the umbilical dent, which resemble water lines, or the lines on a gooseberry, while the interstices are perfectly smooth.

81. ZONITES (CONULUS) CHERSINA, SAY.

We have here a shell, very different in shape from those heretofore described in these pages; instead of having, like them, the apex slightly raised above the body of the shell, we have one in which the thickness, or distance from the apex to the base, will measure as much as the diameter. It is round like a top, with the spire elevated like a cone. It was described by Say, in the *Jour. Ac. Sci. Phila.*, 1821: "Shell sub-globose, conic, pale yellowish-white, pellucid, convex beneath; volutions six; suture moderate; labrum simple; umblicus none."

It cannot be mistaken for any other Rhode Island shell as there is only one other that resembles it at all; this is Strobila labyrinthica, belonging to a different genus. They are of the same shape but chersina is the larger of the two; chersina is highly polished, labyrinthica is heavily striate; labyrinthica has a small umbilicus, chersina has none. In chersina the lip is simple and sharp, and the aperture open and free; in looking into the aperture of labyrinthica, a remarkable peculiarity is seen, which will be explained under that species. Its synonyms are

Helix chersina, Say, Gld., Ad., Reeve, DeKay, Morse, Binney.
Helix egena, Say, Chem., Rve., Pfr., etc.
Conulus chersina, Morse, Tryon.

Many conchologists, both in Europe and America, have labored to prove this species to be identical with Helix fulva, of Europe. I think they must have studied these two shells from poorly figured illustrations and ambiguous descriptions, for if they had compared good specimens of the two species together, they ought not to have made so great a mistake.

It is found everywhere in the United States, east of the Rocky Mountains, under leaves and on the under side of boards and fence rails in moist places. I once found a splendid specimen floating on a chip in Mashapaug Pond. Say found his first specimen in the Sea Islands of Georgia. Its heighth and breadth are about one-tenth of an inch.

82. ZONITES (HELICODISCUS) LINEATA, SAY.

Syns:

Planorbis parallelus, Say.
Helix lineata, Say, Binn., Gld., Ad., Fer., Desh., Chem., etc.
Helicodiscus lineata, Morse, Tryon.

This unique shell was discovered by Say, in upper Missouri, in company with a large number of fluviatile species in a dried up pond. The peculiar form of the shell, so unlike any other land shell in America, together with the circumstance of finding it in such a situation, led him to suppose it was fresh water species, and he accordingly described it as a planorbis. Afterwards, having found other specimens near Philadelphia, under altogether different circumstances, he saw his error, and redescribed it as Helix lineata.

It is not at all convex on the upper side, like all the other species of this genus, but is discoidal or planorboid shaped, that is, round like a wheel, and flat. It has four whorls, equally visible on both sides of the shell and has a series of raised lines revolving on the body whorl. It has a decided greenish color, is one eighth of an inch in diameter, and is very common in Rhode Island under leaves with chersina and labyrinthica, etc. It is not very common in the West, but quite so in New England, along country roadsides. Its aperture is narrow, semi-lunate; lip thin; within the aperture on the outer lip, are situated two small, conical, white teeth, and still farther within the aperture can be seen another pair of similar teeth, and in some specimens, a third pair is seen by breaking away a portion of the lip and whorl. The shape of the shell, its raised revolving lines, its green color, and the peculiar teeth within the aperture, distinguish it from any other species of shell known.

83. ZONITES (STRIATURA) MILIUM, MORSE.

This is the smallest shell yet brought to your notice; its diameter is one-twentieth of an inch. It was discovered by Mr. Edward S. Morse, in Maine, and described in the *Proc. Bost. Soc. Nat. Hist.*, VII., 28, 1859:

"Shell depressed, transparent, shining, white with a greenish tinge, marked with distinct and regular striæ of growth and microscopic revolving lines; whorls three, rounded, rapidly increasing; suture deeply impressed; lip simple and sharp; aperture very oblique; umbilicus very wide and deep, showing all the volutions."

Thus far it has been found only in Maine, Massachusetts, and Rhode Island. Very little can be said of these smaller species; their habits cannot be studied very well, and they are only to be found by diligent search under the moist leaves of our thick, hard wood forests.

(To be continued.)

WE desire to call attention to the collection of shells offered for sale on the last page of this issue. They are exceptionally perfect, of full size, and few collections of its size contain so many rarities.

CHECK-LIST OF GENUS CLAUSILIA. I.

J. RITCHIE, JR.

Clausilia abrupta Küst.
accedens Möll.
acicula Küst.
acridula Ziegler.
aculus Benson.
acuminata Mouss.
adamsiana Pfr.
adposita Strobel.
advena Küst.
agesilaus Martens.
agnata Partsch.
agnella Parr.
alba Küst.
albersi Charp.
albicosta Boettger.
albocincta Pfr.
album Küst.
almissana Küst.
alpina Stab.
alschingeri Küst.
altecostata Zelebor.
amalthea Westerlund.
amiatæ Martens.
amœna Küst.
amorgia Boettger.
anaphiensis Boettger.
anatolica Roth.
angiostoma Küst.
anguina Parr.
angustata Bielz.
aperta Küst.
approximans Ziegler.
aquila Parr.
arcadia Boettger.
archilabris Kutsch.
armata Kutsch.
asaluensis G-Austen.
asphaltina Ziegler.
auriformis Mouss.
austeni Bland.
avia Parr.
bacillum Benson.
badia Ziegler.
balsamoi Strobel.
bargesi Bourg.
basilensis Gredler.
belloti Strobel.
bensoni H. Adams.
bergeri Mayer.
bernandi Pfr.
biasolettina Charp.

Clausilia bicarinata Ziegler.
bicristata Friw.
bidens Linn.
bidentata Strom.
bielzi Pfr.
bigibbosa Charp.
bilabiata Wagner.
binodata Ziegler.
bipalatilis Martens.
biplicata Mont.
bitorquata Friw.
blanci Martens.
blanda Ziegler.
blandiana Pfr.
blaui Möll.
boetica Küst.
boettgeriana Paul.
bogatensis Bielz.
bohemica Clessin.
boissieri Charp.
bonelli Martens.
bosniensis Zelebor.
bourguignata Charp.
brevicollis Pfr.
brevior Martens.
brevissima Benson.
brunnea Ziegler.
bulbus Benson.
buschi Küst.
byzantina Parr.
cærulea Fer.
calcaræ Phil.
callifera Küst.
callocincta Küst.
cambodiensis Pfr.
campylauchen Boettger.
cana Helder.
canaliculata Pfr.
canalifera Rossm.
candida Pfr.
candidescens Ziegler.
canescens Parr.
capillacea Rossm.
carinthiaca A. Schmidt.
carissima Ziegler.
carniolica F. J. Schmidt.
castalia Roth.
castanea Küst.
cataphracta Parr.
cattaroensis Ziegler.
caucasica Parr.

Random Notes on Natural History.

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THROUGH the politeness of the author we are in receipt of the *Bulletin of the United States National Museum*, 29. "Results of Ornithological Explorations in the Commander Islands and Kamtschatka." By Leonhard Stejneger.

We have never studied a similar report with more interest and satisfaction. As a collector and observer the author has been indefatigable, reporting with exactness, in the species described, the fresh colors of bills, irides and feet, about which the dried skins available to most of us can give no idea. Beside the absolutely scientific information, there is much of general interest. We have taken the liberty to reprint elsewhere a portion of the article on the Tufted Puffin, *Lunda cirrhata*.

WHILE collecting this last season in an old ravine almost impassable from fallen rocks and the wild rose, a Rock Wren, *Salpinctes obsoletus*, flew out of a hole in the bank which was nearly perpendicular. Upon scrambling up to it I discovered as beautiful a piece of bird architecture as it was ever my fortune to behold. The nest, which was in the hole, contained four young and one egg. On the outside the sand was levelled off so as to form a shelf about a foot in diameter. It was nicely levelled off and paved with small flat stones about the size of an old cent, laid to fit one another in a wonderfully artistic manner, reminding one of the map puzzle with which we were all familiar in our boyhood. I have discovered one nest before, and that was situated in a similar position, but had no such outside decorations.

WM. G. SMITH.

The Stone Chat. *Saxicola œnanthe*, No. 21 of the Ridgeway list, is the Wheatear of Europe, and not the Stone Chat, *Pratincola rubicola*.

The European Titlark, *Anthus pratensis*, No. 72, is the Meadow Pipit, and this name should be adopted here as they have another Titlark, the Tree Pipit.

The Yellow Wagtail, *Budytes flava*, No. 70, is their Grayheaded Wagtail.

F. T. J.

"Toporok" Tufted Puffin.

(LUNDA CIRRHATA) PALL.

From U. S. N. M. Bulletin, No. 29.

[Results of Ornithological Explorations in the Commander Islands, and Kamtschatka. By Leonhard Stejneger.]

THE "*Toporok*" (plur. "*Toporki*"), together with the "*Are*" (*Uria arra*), is the most numerous of the many species of the *Alcidæ* on the islands, and as both are also the largest in size, they become of eminent importance to the natives as sources of fresh meat. This is especially the case on Copper Island, the area of which is more limited, and where the inhabitants have fewer facilities for preserving the meat of the fur-seals slaughtered during the short season of the summer. To them, the adults, young, and eggs are the most welcome additions to their bill of fare, and, indeed, I myself was very often gratified by a good meal of fried "Toporki," for the meat, although very dark, is by no means distasteful. I remember occasions when I thought I had never eaten anything better, when fur-seal-tongues and toporok-breasts were esteemed higher than deer-tongues and goose-breasts are to-day.

But it is not only for food that these birds are used. The skins are carefully flayed off, and made into wide and long, very warm and nice garments, the so-called "*parka*," with the feathers turned inside. About fifty skins are required for one "parka." In order to remove the fat from the skins, they are chewed over and over again by the women and children until all the fatty matter has been chewed out, that being their method of tanning. These "parki" are rather easily torn, but are extremely warm and light, as I can testify from my own experience. Dressed in one I could go driving in a dog-sledge in the severest cold without feeling any inconvenience, and its lightness would allow me to keep it on when strolling about, away from the sledge, hunting ptarmigans or other ornithological and gastronomical objects.

The yellow feathers of the long ear-tufts are in great demand for decorative purposes. The seams of a fine "*Kamlejka*" (rain coat made of seal-guts) is often tastefully adorned with them.

With the beginning of May these birds commence making their appearance on the coasts of the islands, looking out for their old homes, but for a while they stay mostly on the water, not far from land, until the nests are taken possession of in earnest, which happens about the beginning of the second week of June.

The natives, heartily tired of their winter food, the salted seal meat, look forward to the arrival of the Toporki with great impatience, and as soon as a sufficient number are observed in the neighborhood of the old rookeries parties start off in order to catch a good supply for food and clothing, advantage being taken of the peculiar habits of the birds.

I shall in the following attempt a short description of such an excursion:

On a bright afternoon in May — and at that season really some fine, bright days occur, even on the Commander Islands — we started, a gay picnic party, consisting mostly of Aleuts and their wives or lady friends, for the small island Toporkoff, about three miles off from the village. During our passage out only few birds were seen, as it was no "land day," but I was assured that they would be in on the following morning. The Toporki and their allies show during this season, previous to the breeding, the peculiarity of appearing regularly, as it seems, in great abundance near shore on one day, while next day they have all disappeared, staying away on the high sea for two days, when they again take a "land day." The natives had calculated that the following day would be such a regular land day.

The afternoon passed pleasantly; some were out fishing, the younger members of the party were playing ball, while I was busily engaged in securing specimens of *Troglodytes pallescens*, *Acanthis linaria*, etc., besides odds and ends of plants, insects, mollusks, and crustaceans.

Toporkoff, which has received its name on account of being a rookery of the "Toporki," is a small island consisting of a level plateau about 30 feet above the surface of the sea, rising abruptly from a 50 to 200 feet broad, sandy or rocky beach. The upper surface of the plateau is covered with a thick, hummocky sod, which in every direction is perforated by the numberless holes dug by the "Toporki" and used by them for dwellings to rear their young in.

Water birds were rather scarce near the island, though at a distance large flocks, like black patches, were seen resting on the sea. Now and then a solitary Torporok would cross overhead in its straight flight; a few cormorants (*Phalacrocorax pelagicus*) aired their wet wings on the outlying rocks, stretching their long necks in all directions; noisy gulls (*Larus glaucescens*) flew up and down, screaming and scolding at the intruder.

Evening set in, and the picnic party returned, leaving us men with the bajdarkas. Toporki crossed the island more frequently, but not in such numbers that it was thought worth while to try catching them. A campfire was started for the preparation of the tea, and soon the indispensable "samovar" was humming its cheerful tune. My Aleuts were unusually silent and dull, and we soon crept into the hull of the bajdarkas, a snug and rather comfortable bed, though smelling considerably from seal-oil, that peculiar smell which characterizes almost everything on the islands, and to which the outsider will have to adapt himself if he wants to feel comfortable during his sojourn on the seal islands.

The ornithological spectacle at daybreak the following morning was quite different from what it had been the foregoing day. Hundreds and thousands of *Lunda cirrhata* crossed and recrossed the island, coming from all directions, and disappearing on the opposite side in order to return again and again. A wonderful sight! The black birds, with their conspicuous white face-mask, the long and floating yellow ear-tufts bent like the horns of a ram, and the large-green-and-red-colored beaks and red legs, looked more like fantastical creatures of the tropics than inhabitants of the less extravagant north. Their flight seemed to have no particular aim except to view and review the spot where they were going to take up their summer abode, for they flew singly upon their straight courses, no one taking notice of the others. Like black specks they rose from the horizon heading for the island; the nearer they came the bigger they grew, until they passed over us, disappearing as specks again on the other side, and when first started nothing seemed to be able to bring them out of their straight course. These clumsy looking, puffy birds possess, nevertheless, a very rapid flight, so that at the first acquaintance one is rather apt to shoot behind them, but they do not rise very high in the air, especially when passing over the upper plateau of the island.

The natives take advantage of these peculiarities, and their device for catching the Toporki is based upon the apparent difficulty of the bird to make a sudden turn in its straight flight.

A piece of wide-meshed net-work stretched on a hoop, about four feet in diameter, fixed to a light pole, 10 to 12 feet long, is the instrument used in catching the Toporki, by suddenly throwing it in the way of the bird, who flies directly into it, and thus falls to the ground and is captured.

When I turned out the Aleuts were already in their places waiting for the rush of the birds, which had not yet begun. They were scattered pretty evenly around the island, seated on the edge of the bluff. Their immovable figures, wrapped in the warm "parka," or the lighter "kamleika" were clearly visible against the gray westtern sky, and now with the dawning day we discern the net at their side, but what is more surprising, each one surrounded by a small flock of Toporki. These stretch their necks and point with their bills straight up in the air in quite an unaccountable manner, remaining so long in that rather unnatural position that we become suspicious. A closer inspection reveals that these are only decoys, empty skins held in position by a stick protruding between the jaws and with the other end thrust into the ground.

Before long the sea and the horizon become lively with birds, and soon the sky above us literally swarmed with these red-and-green-beaked, white-masked, yellow-horned masses. It was "land-day" indeed! I only wondered that they did not suffer collision with each other during their airy sailing, for they were thick as May-flies round an electric light, and flew both straight and rapid.

When a Toporok crosses overhead of an Aleut he suddenly raises his net; the bird, unable to turn aside, runs into it with a clash, falls to the ground, and in a twinkling is added to the heap of other unfortunates with broken necks.

When full day has set in this sport is at an end, as then the birds fly higher, and now comes the moment for me and my gun.

To the accompaniment of the buzzing breakfast-"samovar," I wrote down my memoranda on fresh colors, individual variation, moulting, etc., surrounded by hundreds of specimens, selecting desirable objects for skinning, and preparing colored sketches of the fresh colors of bills, eyes, etc., before they fade away and dry up.

The eggs are white, without gloss, usually with faint lilac spots, which are more numerous in a wreath around the blunt end. Owing to the location of the nests in holes dug in the soil, the eggs are always more or less stained.

* * *

THE turkey buzzard has been supposed to be a silent bird. Mr. Burroughs mentions a roosting place at Red Rock near Washington, D. C., where great numbers perch for the night. Their actions are much like those of our domestic turkey. Perching upon the limb, they walk along, and when a suitable place is found they make a peculiar noise, like that of a cow blowing through her nose on lying down; this is the only noise he has observed from this bird.

A few years ago, in early spring, as one of these birds was flying about fifteen feet above my head, I heard it make a noise exactly like the cluck of the domestic turkey-hen.

JOHN H. STEELE,
Pottstown, Penn.

The Forest Trees of Rhode Island.

BY L. W. RUSSELL.

No. XII.

Castanea — The Chestnut.

The common chestnut tree, *Castanea vesca*, is closely allied to the oaks, *Quercus*. It is abundant in Rhode Island. Many of the rocky hills and ridges in Providence and Kent counties, are still growing large lots of chestnut trees. They sprout readily from the stumps of felled trees, and grow very rapidly. A growth of twenty-five years will give two or three cuts large enough for railroad ties. There are numerous lots in the state which have been cut several times and the latest growth is still vigorous. The soil of the state, in general, is well adapted for producing this tree. It will flourish well in light sandy, or gravelly soils, but does better upon rocky hills where the roots can penetrate the crevices, or anchor themselves among the stones. It is a stately tree when fully grown. Sixty to eighty feet is not an uncommon height in the forest, where it grows without limbs, except a few short ones at the top. In open grounds it spreads widely, growing in favored situations to large size. Observers of trees will call to mind single specimens now standing, having bodies from fifteen to twenty feet in circumference, near the ground, and from fifty to eighty feet in height. The spread is often as great as its height. At the distance of an eighth of a mile or more, the tree has a peculiarly sturdy appearance. The limbs are large and stiff, the whole top appearing as though it had been under the gardener's shears. This characteristic alone will enable one to identify the tree at a long distance.

The bark of this tree is thick and firm, on young trees smooth, brown in color, with a greenish tinge; but from ten or twelve years of age, dividing by long furrows, growing deeper and wider with age. On old open, grown trees, the bark is very rough and thick.

The leaf of the chestnut is conspicuous for its large size, its prominent parallel veins ending in long bent points, separated by large curved indentations. The leaves are of a lively polished green above, paler beneath, turning to orange or buff color in autumn. The foliage is abundant and noticeable for the radiated tufts of leaves near the ends of the branches.

The male or sterile flowers are in bunches of stiff catkins, long as the leaves, very conspicuous, emitting a profuse, and to most people a disagreeable odor. The flowers are arranged in groups along the stalk of the catkin. The fertile flowers are in little bunches in the axils of the upper leaves, afterwards developing into burrs containing the fruit. They are seen single, or two or more near each other. The fruit is too familiar to need description.

The fruit as grown in Rhode Island, is generally smaller and inferior to that grown farther from the sea-coast, although it is sometimes abundant.

The wood, although containing only about one-half the heating power of hickory, is valuable for charcoal, and makes excellent kindlings. For timber, as applied to various uses, it is of great value. The grain is handsome in furniture, it is very durable and is sufficiently tough and elastic for many uses. But few native trees will grow to a size fit for use so quickly. A natural chestnut forest ground is a valuable piece of property. The crop is sure of growth, certain of sale; and many now sterile, utterly profitless tracts of New England land might be planted with chestnuts with certainty of good pay for the labor.

It may be mentioned that the Spanish Chestnut, so called, is not regarded as a different species from our own, although the fruit is much larger, and also greatly inferior in quality to ours. The Spanish Chestnut is largely cultivated in southern and central Europe, the fruit forming an important article of diet for the poorer classes of people.

The dwarf chestnut of the central and southern states of our own country, is a mere shrub, there being but a single oval nut in a burr, which is very sweet.

The writer would suggest that orchards of our native chestnut trees, planted from the best varieties (and they differ much in size and quality of fruit) might prove as profitable an investment as orchards of some other fruit trees.

Providence will soon celebrate, at considerable expense, its two hundred and fiftieth anniversary. Still we have not a public museum or art gallery.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XVIII.

2. ORDER URODELA. We now come to the tailed Batrachians, the so-called salamanders, newts, efts, and tritons. These animals differ from the frogs in possessing, through life, a well-developed tail, which often exceeds the body in length. It will be remembered that the frogs had a tail at a certain period of their lives, though this became resorbed as the animal changed from young to adult. The salamander, then, represents the more imperfectly developed frog, and is hence regarded by evolutionists as holding an inferior position. To this branch but little attention has been given by the naturalists of the state, and there is consequently but little material collected on which to work out the native forms. The writer trusts, however, that a brief description of the more common representatives, will result in interesting those who have opportunities for working out more definitely what we ought to know about all.

1. *Diemyctylus miniatus Rafinesque.* The common Salamander or Newt is one of those forms which presents so great a variety of form and color, that naturalists have often mistaken specimens of odd appearance for representatives of new species, resulting in a most confused state as regards the animal's real name. *Salamandra stellio* and *S. symmetrica* have given place to the name adopted above; while a form long considered to be a different species, *Diemyctylus viridescens*, has lately been shown to be only an extreme variety.

The common Salamander is abundantly found in all parts of the state, and is the most common representative of the order. In length it is about three inches, and is generally dull olive-red above, and yellowish red below; the whole body being more or less covered with small black dots. Along each side is a row of red spots which are very characteristic. The tail is provided with a fin of considerable size, the upper part of which is developed in the males at certain periods of the year into a high crest. The bright colors, attractive habits, and the ease with which it can be domesticated, render this form one of the most popular pets, and is often to be seen in the aquarium of the amateur naturalist.

The time for this animal's appearance is now almost here, though it can be secured at almost any time of the year. That it can well endure the cold is apparent, for specimens are often captured late into December, and the writer has several times observed them, as they crawled about on the decaying sedges of some muddy pond, long after ice had covered them over. When thus moving about they were evidently in search of food, possibly for some small fresh water mollusks or larval beetles. In the warmer weather, they are often to be seen in numbers, under culverts and in slow running streams, and not infrequently some adventuresome one crawls away from the water to forage on the abundant insect life, which is to be found among the bits of decaying twigs and leaves of our damp forests. When thus surprised it seldom makes any effort to escape, and on being handled only continues to gulp down air, as though in that lay its only hope of salvation. Early in the spring the males, adorned with far gayer colors than usual,and with a most remarkable expansion of the tail, begin their courtship. The eggs of the female are much like those of the frogs, being deposited in clusters, attached to twigs or to grass. Each egg is surrounded by a mass of glairy substance, which expands in coming in contact with the water, and both serves to protect the eggs from external injury, and is devoured by the young as food.

After the mating season is over with, we are told by Col. Nicholas Pike, that "both sexes leave the water and hide, without feeding, under stones and tussocks. The young of the second year sometimes leave the water for months together and secrete themselves in damp places. When droughts occur and the ponds dry up I have often dug them out, all huddled together, more than a foot below the surface, and where the clayey ground has been so parched that they are unable to burrow they are often seen several together, dead or dried up."

MR. A. H. JAMRACH, prominent in London, Eng., as a dealer in specimens of natural history, died Nov. 14, 1885, aged forty-four years.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXVI.

84. ZONITES (PUNCTUM) MINUTISSIMUM, LEA.

SHELL broadly umbilicated, sub-globose, reddish horn color, shining, marked with strong transverse striæ and microscopic revolving lines; whorls four, convex; aperture sub-circular, oblique; lip simple, acute.

This species was first found in Cincinnati, O., and described by Mr. Isaac Lea in *Trans. Am. Phil. Soc.* IX., 17, 1841. It has since been found in Maine, Massachusetts, Rhode Island, and New York. It is the smallest land shell in America, perhaps the smallest in the world, its diameter being only four one-hundredths of an inch.

Mr. E. S. Morse proposed a new genus, Punctum, for this species, in 1864, as the buccal plate differs from all other species of Zonites. The jaw of all the others consists of one solid plate, while that of this species consists of sixteen distinct pieces. P. minutissimum is the only species of the genus. Tryon in his *Structural and Systematic Conchology*, III., 25, 1884, places it under Zonites as a sub-genus.

Family Helicidæ. An enormous family of land snails containing a great number of genera and several thousands of species. The following description, however, applies to all its members. Shell external, usually well developed, and capable of containing the entire animal; aperture closed by a layer of hardened mucus, (minutely perforated opposite the respiratory orifice), during hybernation, which takes place in cold regions in winter, and in hot countries in summer. The principal genus of this family is called Helix, meaning a coil. The original Helix of Linné included all sorts of land and fresh water shells and has been restricted more and more by every author who has written on the subject since his time, until after dropping off genus after genus, making new ones out of the species of the old helix, and even whole new families, there were still some thousands of species left in 1834, when Gray separated the genus Nanina. The latest authority, after leaving out more than five hundred species of Nanina, and many more of Zonites, gives the number of species of Helix as thirty-four hundred, which he divides up into forty-seven sub-genera, each with numerous sections or groups. I think the use of the term helix should be abandoned altogether. Many conchologists are in the habit of using the sub-generic names in a generic sense, and even the sectional or group names in the same manner. I propose in these papers, and also in a work on the genera of shells which I am now engaged in writing for publication, to drop the term helix altogether and to use the larger groups, such as Mesodon, Patula, Polygyra, Stenotrema, etc., in a generic sense, and the others as sub-genera. Of the above thirty-four hundred species, only about one hundred and twenty-five inhabit the *United States*, and only eight are known to inhabit *Rhode Island*.

GENUS MESODON RAF., 1831.

Shell large, sub-globose or orbicularly depressed; aperture rounded lunar; peristome white lipped, sometimes dentate on the parietal wall, and sometimes on the basal margin, whorls five or six, regular; umbilicus partly or wholly covered by the expansion of the lip. Generally of a uniform pale horn color.

This genus is found only in the *United States*. There are twenty species, two of which inhabit *Rhode Island*.

85. MESODON ALBOLABRIS, SAY.

This species, the largest in size of any of our Rhode Island *land* shells, is found everywhere in dark, hard wood forests from *Canada* to *South Carolina*, and westward to *Nebraska*. It is universally distributed within the above named limits, and is a very handsome, well proportioned shell.

It was first noticed by Mr. Thomas Say, the first and greatest naturalist of America, and described by him as Helix albolabris, in the American edition of *Nicholson's British Encyclopædia of Arts and Science* published in Philadelphia, 1816, in the following words:

"Shell thin, fragile, convex, imperforated with six volutions, whorls obtusely wrinkled across, and spirally striated, with very fine impressed lines, a little waved by passing over the wrinkles, both becoming extinct toward the apex, which is perfectly smooth; aperture lunate, not angulated at the base of the column, but obtusely curved; lip contracting the mouth abruptly, widely reflected, flat, and white. Breadth one inch."

The animal deposits its eggs in May or June according to locality, in the light mould by the side of logs and rocks. If these eggs are taken and kept in a warm room, we can raise them, and thereby obtain more delicate and symmetrical shells than those found in the woods. The eggs hatch in from twenty to thirty days, the young snail being provided at birth with a shell of one and a half whorls. They make their first repast on the pellicles of the eggs from which they have just emerged. They will eat a mixture of flour or meal and water and are very fond of young cabbage or lettuce leaves. Care must be taken to keep the full light of the sun from them and to give them plenty of air and moisture. They attain their growth in two years, or much sooner if a little powdered chalk or other preparation of lime is mixed with their food. When about half grown they can scarcely be distinguished from the next species, the umbilicus being open, and the lip sharp and thin. When they have arrived at maturity, the lip thickens and is reflected over the umbilicus, which it completely covers.

Like all other land snails in temperate climates, they cease to feed in October, and select a place under some log or stone, and fix themselves mouth upwards. They then withdraw their bodies within the shell, and having secreted a thin transparent membrane with which they cover the mouth of the shell, thereby excluding the rain and cold, they lie dormant until the next spring, when, as Gould says, "they break down this barrier and enter upon a new campaign of duty and pleasure."

In watching these animals in captivity, I have noticed that whenever the earth in the bottom of the dish in which they were kept, became dry, they would always retire into their shells, and having stretched across the aperture their thin glistening membrane, they would lie dormant until supplied with the necessary moisture. This they would do at any and all times of the year; although being kept in a warm room all winter, they did not hibernate as they do in the woods. Probably they do the same in summer in their native haunts, for the best time to find them is just after a rain.

Though timid and evidently frightened when first taken, they soon become accustomed to being handled, and love to be bathed and fed with fresh leaves; and while feeding so transparent is the body of the animal, each particle of food can be seen passing from the mouth, over the top of the head between the tentacles, to the stomach. While eating, a peculiar nipping, rasping sound is heard, caused by the denticles or teeth of the snail tearing its food in pieces. The teeth of all mollusks are situated on their tongues. They are very numerous, and are placed in rows; they are pointed and recurved, or turned backwards. The tongues of the molusca are very interesting to microscopists. By leaving the animal in a weak solution of potash for a few days the body will completely dissolve, leaving only the tongue, which is about one quarter of an inch long and one-eighth of an inch wide in this species. The number, size, and shape of the teeth differ in each species. In Mesodon albolabris, or the white lipped snail, the number is about ten thousand.

There is a variety of this species found sparingly in some of the states, called dentata, which develops a small tooth, or rather a calosity (for it never attains the size of a respectable tooth) on the parietal wall. I found only four specimens of this variety in Rhode Island, all of which were obtained in Cumberland, near Beacon Pole Hill.

(To be continued.)

NOTICE.

MR. OLIVER DAVIE has met with trouble and disappointment in the destruction, by fire, of the plates prepared for his forthcoming *Egg Check List*.

The work will necessarily be delayed a few weeks longer, but I shall have plenty of them as soon as issued.

Two Sea Doves, *Alle nigricans*, were shot near Warwick, during a storm, about the middle of February.

CHECK-LIST OF GENUS CLAUSILIA. II.

J. RITCHIE, JR.

Clausilia cecillei Phil.
ceylanica Benson.
charpentieri Pfr.
chia Boettger.
cinerascens Küst.
circumdata Friw.
clandestina Parr.
clathrata Friw.
closta Boettger.
coarctica Mouss.
cochinchinensis Pfr.
cognata Boettger.
colbeauiana Parr.
colorata Küst.
comensis Shuttl.
commutata Rossm.
comparata Parr.
compressa Pfr.
concilians A. Schmidt.
conemenosi Boettger.
confinis Parr.
conjuncta Parr.
connectens Westerlund.
conspersa Parr.
conspurcata Janin.
contaminata Ziegler.
constricta Kutsch.
corcyrensis Mouss.
corpulenta Friw.
corticina v. d. B.
corynodes Helder.
costata Ziegler.
costulata Janin.
costulifera Möll.
courquiniana Bourg.
crassicostata Benoit.
crassilabris Küst.
crenulata Ziegler.
cretacea Küst.
cretensis Mühlf.
crispa Lowe.
cristatella Küst.
cristicollis Westerlund.
cruciata Studer.
cumingiana Pfr.
curta Rossm.
cusmichi Kutsch.
cyclostoma Pfr.
cylindrelliformis Bourg.
cylindrica Gray.
cylindricollis Küst.
dacica Friw.
dalmatina Partsch.
davidiana Bourg.
decipiens Rossm.
decolor Küst.
decorata Küst.
deltostoma Lowe.
densestriata Ziegler.
denticulata Olivier.
derasa Mouss.
detersa Ziegler.
dextrorsa Boettger.
diaphana Küst.
diminuta Parr.
dimorpha Küst.
diodon Studer.
dipolauchen Boettger.
discolor Pfr.
disjuncta Mortill.
dissipata Boettger.
distans Pfr.
distinguenda Möll.
divergens Kleciach.
dohrni Pfr.
dolosa Parr.
dominicensis Pfr.
dotzaueri Küst.
draparnaldi Beck.
dubia Drap.
duboisi Charp.
dunkeri Pfr.
dutaillyana Bourg.
eburnea Pfr.
ehrenbergi Roth.
elata Ziegler.
elegans Bielz.
elisabethi Möll.
eris A. Schmidt.
erivanensis Issel.
erjaveci Boettger.
eugeniæ Küst.
exarata Ziegler.
excellens Pfr.
exigua Lowe.
exima Möll.
exoptata A. Schmidt.
expansilabris Boettger.
extensa Pfr.
fallaciosa Küst.
fallax Rossm.
fauciata Parr.

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258 Westminster St., Providence, R. I., U. S. A.

I have just finished a much too hasty perusal of the new book, *Two Years in the Jungle*, by William T. Hornaday, now chief taxidermist in the United States National Museum. Its five hundred pages, descriptive of travel in the wilds of India, Borneo, and the Malay Peninsula, are full of reliable descriptions of the native animals, practical advice regarding their capture and preparation for scientific purposes, with abundant exciting adventures experienced in their pursuit, withal an intensely interesting work. I have taken the liberty to reprint the description of his first tiger hunt.

Receipt for Cement for gumming labels to minerals and shells. — Pulverized gum Arabic, 4 ounces; pulverized white sugar, 2 ounces; starch, 4 drachms.

Dissolve all separately in as little water as convenient. Dissolve starch in cold water, then stir it into sugar water, and then that mixture into the gum water. Boil with great care, as burning will spoil the whole. It is well to use a tin vessel raised from the bottom of another vessel containing water.

After the starch ceases to make the mixture look milky it is cooked, but at least an hour's time will be required.

Keep in large mouthed, tightly corked bottles, or when done pour into a tray covered with strong paper, spreading it evenly over the paper, allow to dry; when dry enough, moisten back of paper and remove it from the gum, dry again thoroughly, break into fragments and preserve for use in wide mouth stoppered jar.

As far as I can ascertain I am the only individual who has discovered nests and eggs of Townsend's Flycatcher, *Myiadestes Townsendi*. On the 17th of June, 1884, I discovered a nest with two eggs. The old female was sitting on them, so there could be no mistake as to the identity. The nest was placed in the end of an old hollow pine tree that had fallen in a horizontal position. The nest was a very rough structure, composed of twigs and needles of the pine, lined with a few dead leaves. The eggs were about one inch in length by five-eighths. The ground color a very light blue, splashed throughout with brick red spots, and a few purple spots at the larger end where the ground color was nearly obscured. The above nest and eggs I sent with the female bird to the Smithsonian Institution. About two weeks later I discovered another nest situated in a similar position in an old pine that had broken off about six feet from the ground, the top portion still leaning against the old stump, and in the latter the nest was placed. It contained four eggs; they were just like the first. The old female which I reluctantly had to shoot, was on the nest. I discovered a few days after that the rodents had been at the eggs and confiscated three of them; the fourth I have yet. Both nests I took in Jefferson County, Col., at about six thousand feet elevation.

Some time ago I took a nest of seven eggs of the Rocky Mountain chickadee, *Parus Montanus*. They were very far advanced. I took out three young birds which I placed in alcohol together with the eggs, and forwarded them to Professor Coes. He wrote me that they were the first that he had ever seen, and was very much surprised to find them pure white, as the whole of the family lay spotted eggs. The nest was placed in an old hollow pine about two feet below the entrance hole, and composed entirely of the hair of the common gray rabbit. I took the above in Jefferson County, Col., at 6,000 feet elevation. Wm. G. Smith.

My First Capture of a Tiger.

FROM "TWO YEARS IN THE JUNGLE."

BY WILLIAM T. HORNADAY.

"We strolled through the Government Forest until nearly noon, when, just as we were about returning to camp, we heard a fearful growling and roaring a few hundred yards in advance which set us instantly on the *qui-vive*. We hurried in the direction of the sound, which continued at intervals for some minutes. I said: 'Tiger, Vera?' and he replied: 'No, sahib, panther, shall we go for it?' 'Of course' and on we went.

"Presently we heard trumpeting and branch breaking half a mile beyond us, and then Vera said the low roaring, or growling noise had been made by the elephants. On our way toward the elephants to have a quiet look at them, we came to a little nullah,* and there in the level sandy bed of the stream was the trail of a large tiger.

"The men carefully examined the huge tracks in the wet sand, compared notes a moment and declared the trail was fresh. Then I examined it for myself, looked wise and said, 'Oh, yes, it is very fresh indeed.' Vera looked anxiously about a moment, examined the bore of my rifle doubtfully, tried to measure it with the end of his little finger, and finally asked me very seriously whether I would dare to fire at a big tiger with that small rifle. I said 'Yes, certainly; just show me one and see.' I did not for a moment allow myself to hope for such good luck as a meeting with the animal that made those huge tracks and a shot at him, but without a moment's delay we started to follow up the trail.

"The little creek ran through perfectly level and very open forest. Its bed was about eight feet below the level, forty feet wide, and almost dry. The tiger had gone loafing leisurely along down the bed of the stream, walking in the shallow water every now and then, crossing from side to side, and occasionally sticking his claws into the bank as if to keep them in practice. Vera led the way, as usual, I followed close at his heels, and we stole along as silently as shadows.

"We had followed the trail about a mile, when we came to a clump of bamboos growing in a sharp bend in the stream. Vera stopped short, grasped me by the arm, and pointed through the clump. He had the habit of grasping my arm with one hand, and pointing with the other whenever he discovered any game, and I could always tell the size and ferocity of the animal by the strength of his grasp. This time he gave my arm such a fierce grip I knew he must have found a tiger.

"Sure enough, there was Old Stripes in all his glory, and only thirty yards away! The midday sun shone full upon him, and a more splendid object I never saw in a forest. His long, jet black stripes seemed to stand out in relief like bands of black velvet, while the black and white markings upon his head were most beautiful. In size and height he seemed perfectly immense, and my first thought was, 'Great Caesar! he is as big as an ox!'

"When we first saw him he was walking from us, going across the bed of the stream. Knowing precisely what I wanted to do, I took a spare cartridge between my teeth, raised my rifle and waited. He reached the other bank, sniffed it a moment, then turned and paced slowly back. Just as he reached the middle of the stream he scented us, stopped short, raised his head and looked in our direction with a suspicious angry snarl. Now was my time to fire. Taking a steady, careful aim at his left eye, I blazed away and without stopping to see the effect of my shot, reloaded my rifle with all haste. I half expected to see the great brute come bounding round that clump of bamboos and upon one of us; but I thought it might not be I he would attack, and before he could kill one of my men I could send a bullet into his brain.

"Vera kept an eye upon him every moment, and when I was again ready I asked him with my eyebrow 'Where is he?' He quickly nodded, 'He's there still.' I looked again and sure enough he was in the same spot, but turning slowly around and around, with his head held to one side as if there was something the matter with his left eye! When he came around and presented his neck fairly, I fired again, aiming to hit his neck bone. At that shot he instantly dropped upon the sand. I quickly shoved in a fresh cartridge, and with rifle at full cock and the tiger carefully covered we went toward him slowly and respectfully. We were not sure but that he would even then get up and come at us. But he was done for, and lay there gasping, kicking, and foaming at the mouth, and in three minutes more my first tiger lay dead at our feet. He died without making a sound.

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* "Nullah is an Indian term of the most comprehensive signification used in speaking of any channel or water-course, and applied alike to a small river or deep ravine, to the sandy bed of a dried up stream, or a wet gutter."—A. C. McMASTER.

"To a hunter the moment of triumph is when he first lays his hand upon his game. What exquisite and indescribable pleasure it is to handle the cruel teeth and knife-like claws which were so dangerous but one brief moment before; to pull open the heavy eyelid; to examine the glazing eye which so lately glared fiercely and fearlessly upon every foe; to stroke the powerful limbs and glossy sides while they are still warm, and to handle the feet which made the huge tracks that you have been following in doubt and danger.

"How shall I express the pride I felt at that moment! Such a feeling can come but once in a hunter's life, and when it does come it makes up for oceans of ill luck. The conditions were all exactly right. I was almost alone and entirely unsupported, and had not even one 'proper' weapon for tiger hunting. We met the tiger fairly on foot, and in four minutes from the time we first saw him, he was ours. Furthermore, he was the first tiger I ever saw loose in the jungle, and we had outwitted him. I admired my men quite as much as I did myself. They were totally unarmed, and they had seen me miss spotted deer at sixty yards; but instead of bolting as I should have done had I been in their place, they stood right at my elbow like plucky men as they were. What if they had been of the timid sort? They would never have consented to follow the trail of that dangerous beast.

"I paced the distance from where we stood to the dead tiger, and found it to be just thirty yards. My first was a dead centre shot, striking him exactly in the left eye, scarcely nicking the edge of the lid. I had intended that that bullet should enter his brain, but owing to the narrowness of the brain cavity it only fractured the left side of the cranium. However, it rendered him quite powerless either to fight or run away, and he would have died very soon from such a terrible wound. In fact, I now think my second shot was really unnecessary. Owing to the position of his head I could not possibly have placed a bullet in his forehead so that it would have reached the brain, but had I been using a regulation 'No. 8 bore rifle' throwing a two ounce ball, I could have blown the whole top of his head off very neatly (!) and utterly ruined him as a specimen. My second shot struck one of his neck vertebræ and cut his spinal cord, killing him instantly, a favorite shot with me when I can catch an animal at rest.

"He was a splendid specimen every way, just in the prime of tigerhood, fat, sleek, and glossy. Up to that time, I could not make myself believe that a tiger can pick up a man in his mouth and run away with him as easily as a terrier does with a rat. But when I measured that great brute I saw and realized just how it was done. Before touching him with a knife we measured him carefully twice, and recorded the figures in my note book.

FELIS TIGRIS.

Animallai Hills, Sept. 27, 1877.

Length from tip of nose to end of tail vertebræ	9 ft.	8½ in.
Length of tail alone	3 "	6 "
Vertical height at shoulders	3 "	7 "
Girth	4 "	2 "
Circumference of neck	2 "	8 "
Circumference of head around the jaws	3 "	0 "
Circumference of forearm	1 "	8 "
Width of fore paw		6¼ "
Weight (by standard American scales)	495 lbs.	

MR. THOMAS MORGAN, of Somerville, N. J., reports Bluebirds singing in his garden, Feb. 8th and 10th, 1886.

In the vicinity of Providence, February 10th and 13th, Bluebirds, Robins, and Chickadees. March 11th, Song Sparrows. March 13th, red and buff shouldered Blackbirds, white-bellied Nuthatch, Downy Woodpeckers, with Bluebirds and Shore Larks abundant.

Destroying Caterpillars.

During the past year or two many interesting experiments have been made and valuable results obtained in the way of artificially introducing disease among communities of caterpillars, a sort of caterpillar plague or pestilence which carries them off by thousands. There is a very fatal disease which appears from time to time among silk worms, the larvæ of *Bombyx mori* when bred for the production of silk, a disease which spreads so rapidly that it frequently destroys entire broods of caterpillars within a few days. So destructive has it been that it is estimated that the silk crop in Europe is damaged by it to the extent of many millions of dollars annually. During the past ten years it is believed to have reduced the income of silk breeders some twenty-five per cent., and in 1879 was said to be the main cause in the great falling off in the silk crop of that year, which was only about one-fourth of the amount ordinarily produced. The celebrated Pasteur investigated this disease, and found it to proceed from the presence of an exceedingly minute form of bacteria, so excessively small that it has been estimated that it would require eight millions of them to cover the head of an ordinary pin. When water containing these minute organisms is sprinkled on the leaves on which the silk worms are fed, they are found to be rapidly infected and capable of communicating this pestilential disease to others with which they are associated. The bacteria may be preserved in a torpid condition without loss of effectiveness for at least a year, probably for several years, and that without any particular care, and when required for use can be rapidly propagated in a suitable fluid.

Throughout most of the State of Illinois and in some parts of Michigan, it was observed last autumn that a large proportion of the cabbage worms sickened and died. Hundreds of their bodies were to be seen rotting on the cabbage leaves or shrunken and dried to a blackened fragment. This was soon brought under the notice of the State Entomologist of Illinois, Prof. S. A. Forbes, a most careful and indefatigable observer, who at once proceeded to investigate the cause of this caterpillar plague. He found the disease at first to be very unevenly distributed, some isolated fields showing no trace of it, while others not far distant were fairly reeking with death and decay, but as the season advanced it spread in every direction until in some districts almost every worm perished. He says, "We can conceive something of the significance of this disease if we imagine the terror and dread which would seize mankind if such a plague should suddenly assail human life. There would be no escape for any, because the contagion would be conveyed by the very food and drink by which life was sustained."

By dissecting specimens of the dead caterpillars, the microscope showed their intestines to be full of undigested food and swarming with a species of micrococcus, which appeared in the form of excessively minute spheres about one twenty-five thousandth of an inch in diameter, sometimes single, sometimes in pairs, and occasionally in strings of from four to eight. He found that these minute organisms could be readily cultivated in beef broth, and that a single drop of fluid from a diseased worm introduced into a vessel of such broth, would in two or three days render the whole contents milky with myriads upon myriads of these microscopic organisms precisely the same as those taken from the diseased larvæ. He also found by experiment that the disease could be communicated to other species of caterpillars. Experiments continued during the present year have shown that by propagating this form of bacteria in the manner described, and mixing a pint of a well-charged culture with a barrel of water and syringing cabbages with this fluid, the disease may be introduced thus furnishing us with another means of defense against some of these injurious insects.

Wm. Saunders, *Canadian Entomologist.*
December, 1885.

Mica in Canada.—During the past two years muscovite has been discovered in Canada in marketable sizes and paying quantity. The Villeneuve Mine in the county of Ottawa, has been worked continuously the past year, and has produced many thousands of pounds of mica, perfect in quality, in sizes varying from sheets for stoves up to plates 14 x 12 inches.—*Canadian Mining Review.*

The Forest Trees of Rhode Island.

BY L. W. RUSSELL.

No. XIII.

Fagus—BEACH.

ALTHOUGH the beach, *Fagus Jerruginia*, is to be found in various localities about the state, it is by no means a common tree of the woods. It occurs most frequently in cool situations, especially by the banks of streams and ponds. It is probable that neither the soil nor the climate of this region is favorable to the production of this tree in large numbers. Still, there are some fine specimens of this species now growing and the excellent qualities of the tree make it a desirable one for preservation and cultivation. There are few better shade trees than a well developed beach in open ground. It has a wide spread, orbicular in shape, and a very dense foliage which is always clean and free from insects. In open ground it limbs low, six to eight feet from the base, sending out numerous long, somewhat irregular arms, dividing into lithe branches and fine spray, at sharp angles towards the ends, but starting from the massive trunk at wide angles, the lower ones becoming nearly horizontal as the tree becomes well-grown.

The trunk gradually shapes itself from a circular combination of prominent roots, which may frequently be traced in fluted ridges up to the limbs. The roots keep near the surface of the ground, often in sight, never striking deep. For this reason shrubs rarely grow under the trees, and herbage is scant.

The bark is thin and smooth until upon old trees it becomes spotted, or wholly covered with variously-hued lichens. Its color upon young trees is that of lead or ashes. The buds are noticeable for their long spindle shape, being composed of delicate ribbon-like scales. When the buds open, they reveal a number of delicate leaves from the midst of which roundish tassels of beautiful flowers soon develop. The fruit forms during the summer months, and is peculiar from the shape of its angular three-sided nuts inclosed in a four-valved burr covered with fringed scales. The leaves, when young, have a pinkish tinge and a not unpleasant acid taste. As the leaves become full-grown, they are of a deep-green, shining above, with prominent midrib, from which come numerous parallel veins, ending in a sharp tooth. The leaves come late and are more persistent than any other native forest tree, often remaining on low trees until they are pushed off by a new growth. In autumn the leaves turn to various shades of orange and brown. The wood is compact, with a fine silver grain making it desirable for cabinet work. It is much used for chair legs and frames, and for various tools; also, is a valuable fuel. There is a makred difference in the "heart" and the "sap" wood, the latter being the tougher. The terms "red" beach and "white" beach are given by lumbermen in accordance with the predominence of one of the two kinds of wood in the different trees.

The beach is a desirable shade-tree. A pasture beach is always a favorite with cattle in hot weather. Its wide spread branches dense, clean foliage, and general beauty, make it, also, well adapted for a wide lawn or rustic shade. Like most nut-bearing trees it is difficult to transplant it successfully, unless it is grown in a nursery. There may occasionally be seen fine spreading beach trees in Rhode Island. There is a model tree of this kind upon the farm of Engineer Herbert Shedd, in North Kingstown. The tree will flourish in any good soil of average moisture in this region. Its range of growth is extensive, it being found as the principal forest tree upon large areas in the north temperate zone of both hemispheres. In the forest it is a remarkably beautiful tree, tall and straight, the bole tapering very gradually, reaching sixty to eighty feet in height with only here and there a small branch, having branches at the top which adapt themselves to the space given. One can walk in a forest of beaches, upon a soft carpet of leaf mold, and hardly meet a shrub, and only a few characteristic herbaceous plants. Some of the finest forests of beach in this country may still be seen in western Massachusetts among the Berkshire Hills.

The "copper leaf" beach is a "sport" originally from Germany, making a most beautiful ornamental tree. The "weeping" beach also originated in Europe, and, like all "sports," is only obtained by grafting or budding. The "fern-leaf" beach is the most beautiful and graceful of all, obtained only by grafting, and with difficulty. One of the finest trees of this kind in this country is in the grounds of the Redwood Library, Newport.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXVII.

86. MESODON THYROIDES, SAY.

THIS species was also discovered by Thomas Say, and described in October, 1817, in the *Journal of the Academy of Natural Sciences*, Philadelphia, as Helix thyroides. It is the Anchistoma thyroides of H. and A. Adams. The following is the original description by Say: "Shell thin, fragile, convex, umbilicate; whorls five, obtusely wrinkled, or rather with equi-distant, gradually elevated obtuse lines, and spirally striate, with minute impressed lines; lips widely reflected, white and flat before, partially concealing the umbilicus; pillar lip furnished with a very oblique tooth. Breadth four-fifths to nine-tenths of an inch." It is found over nearly the same extent of territory as Mesodon albolabris, but is rare in New England. The only locality where I have been able to find it in Rhode Island, is in the deep woods back of the so-called copperas mine in Cumberland, between Cumberland Hill and Diamond Hill. This species somewhat resembles albolabris, but is distinguished from it by its partly open umbilicus and its oblique white tooth. The outer lip is thinner and more delicate, the aperture is more oblique, and the shell is more globose, and smaller in size. Western specimens attain a diameter of one inch and the tooth on the inner lip is strong and solid. Rhode Island specimens are never over three quarters of an inch in diameter; they have a delicate tinge of pink on the reflected outer lip, which is not seen on the solid white lip of the western ones, and the tooth is only slightly developed. Although considered the same as the typical thyroides of Say, our shells resemble in general appearance the Mesodon bucculenta of Gould more than any other American shell. M. bucculenta is southern in distribution and has not been found north of Pennsylvania. I am very much inclined to believe our shells are bucculenta, or rather, that the species called by that name are only local varieties of thyroides. The land shells of Rhode Island, compared with the same species from other parts of the country, are dwarfs. This remark does not apply to the fresh water or marine species, as *they* are as large and sometimes larger than those found elsewhere. The reason is that our soil, composed mostly of granite, is deficient in the lime necessary for the snails to produce exuberant shells. I think if the eggs of our M. thyroides or other species should be taken to Ohio and raised there, they would develop just as large and solid shells as the natives, and *vice versa*.

GENUS PATULA, HELD., 1837.

"Shell perspectively umbilicated, discoidal or turbinated, depressed, rugose or striated; whorls gradually enlarging; aperture rounded, unarmed by teeth; lip simple, sharp."

This genus is divided into twenty-four sub-genera and three hundred and twenty-seven species, distributed all over the world. Three of these sub-genera are represented in Rhode Island, and two more in other parts of New England.

87. PATULA (ANGUISPIRA) ALTERNATA, SAY.

Syns.:

Helix alternata, Say.
" scabra, Lam., Desh., Chem.
" infecta, Pfr., Parr., Reeve.
" strongyloides, Pfr. Reeve.
" mordax, Shutt., Gould, Pfr., Bld.
" dubia, Sheppard.
Anguispira alternata, Morse, Tryon.

This shell, rejoicing in so many appellations, was also discovered, and described by Thomas Say in *Nicholson's Encyclopædia*, 1817, as follows:

"Shell somewhat convex, fuscous, varied or alternating with pale rays; whorls five, striated across with raised, equi-distant, acute lines, forming grooves between them. Aperture thin and brittle, lip regularly curved, within glossed with pearlaceous, and when placed before the light the fuscous lines appear sanguineous. Umbilicus large, exhibiting all the volutions. Three-fourths of an inch wide. Inhabits the Middle States." Since Say's time it has been found in every state east of the Rocky Mountains.

Morse's description of the New England specimens in the *American Naturalist*, June, 1867, differs somewhat from Say's: "Shell flattened, heavily striate, light horn color, with dark brown bands arranged obliquely across the whorls. Aperture when viewed from below nearly circular, lip simple and sharp, whorls six. The base of the shell is lighter in color than the upper surface. Diameter one inch."

These shells are found all over our state on decaying stumps and logs, but never of size given by Morse. Even at Lime Rock in Smithfield, where we find them crawling over the broken masses of limestone, they never exceed three quarters of an inch and rarely attain that size. The difference in size of our alternatas and those from the west is even more striking than in the case of Mesodon albolabris. The shells of this species are carinate while young, that is, they have a sharp line running around the centre of the shell, dividing the upper from the lower surface. This line disappears at maturity, forming a well rounded surface and a circular aperture. Generally several specimens are found together, thus differing in their habits from the preceding species, which are usually solitary.

88. PATULA (DISCUS) STRIATELLA, ANTH.

Syns.:

Helix striatella, Anth., Gld., Binn., Ad., Chem., Pfr., Reeve, Morse.
Helix ruderata, Adams, non Studer.
Anguispira striatella, Tryon.
Patula striatella, Morse.

In 1817 Mr. Say described a shell which he named Helix perspectiva. The species now under consideration was for many years confounded with Say's perspectiva.

Several gentlemen in Ohio, where both species abound, had observed the difference in the two shells sometime previous to 1840, when Mr. John G. Anthony published a description of the new species under the name of Helix striatella, in the *Journ. Bost. Soc. Nat. Hist.*, III., 278. Helix perspectiva is not found in New England, but striatella is very common here and throughout the United States north of Virginia, extending into Canada and British America.

It is about one quarter of an inch in diameter, of a uniform reddish horn color, depressed, convex, almost discoidal; whorls four, flattened above and rounded below, with sharp elevated lines of growth, not parallel with the whorls as in lineata, but across them; suture distinct; lip simple and thin; umbilicus broad and deep, rendering the base of the shell cup shaped. It is found about old stumps and under the bark of decaying logs; also under leaves near the margins of ponds.

89. PATULA (PSEUDOHYALINA) EXIGUA, STIMP.

Syns.:

Helix exigua, Stimp., Gld., Binn., Morse.
" annulata, Case., Pfr.
" striatella junior, Gld.
Pseudohyalina exigua, Morse, Tryon.

This shell was described by Dr. William Stimpson, as Helix exigua, in the *Proc. Bost. Soc. Nat. Hist.*, III., 175, 1850. The genus Pseudohyalina was founded by Morse in 1864. In papers on the "Conchology of Rhode Island" prepared for the Providence Franklin Society in 1871, by the writer, it was described as a sub-genus of Hyalinia. Tryon in *Structural and Systematic Conchology*, 1884, places it under Patula as a sub-genus of Helix. Tryon's *Manual of Conchology*, 1886, classifies it thus: Family Zonitidæ, Genus Zonites, Montfort, 1810. Sub-genus Striatura, Morse, 1864. Section Pseudohyalina, Morse, 1864.

"Shell broadly umbilicated, depressed, pellucid, greenish horn color, marked with delicate revolving lines, and distant, longitudinal ribs, obliquely decussating the incremental striæ; whorls three and a half, aperture oblique, transversely rounded; lip simple, acute."

It is quite common in Maine and in Canada; more sparingly in the other northern tier of states to Wisconsin, and may be considered as a rare shell in Rhode Island. Its umbilicus is wide but shallow, showing all the volutions. Diameter one-tenth of an inch. Under the microscope with a one inch objective, it is a most beautiful object; in fact, the longitudinal ribs and the delicate revolving lines between them cannot be seen unless the shell be magnified somewhat; a common pocket lens, however, will bring out the characteristic marks which distinguish this species from any other of our land shells.

(To be continued.)

The new Union Check-List is now ready. See advertisement.

CHECK-LIST OF GENUS CLAUSILIA. III.

J. RITCHIE, JR.

Clausilia fausta Friw.
ferruginea Blanford.
filicostata Stolickza.
filocostulata Lubow.
filograna Ziegler.
filosa Mouss.
filumna Parr.
fimbriata Mühlfld.
flammula Pfr.
flava Küst.
foliacea Fir.
forbesiana Pfr.
formosa Ziegler.
formosensis Adams.
fortunei Pfr.
fovecollis Parr.
frauenfeldi Zelebor.
fraudigera Parr.
friwaldskyana Rossm.
fulcrata Ziegler.
funiculum Mouss.
fusiformis Blanford.
fusorium Mouss.
galeata Parr.
gallinæ Bielz.
gastrolepta Ziegler.
gaudryi Bourg.
gemmulata Küst.
genezarethana Tristram.
gerlachi Möll.
gibbula Ziegler.
gigas Beck.
glabella Pfr.
glabricolis Parr.
glauca Bielz.
glorifica Parr.
gobanzi Parr.
goldi Kutsch.
goniostoma Küst.
gospiciensis Zelebor.
gouldiana Pfr.
gracilicosta Ziegler.
græca Pfr.
grayana Pfr.
grimmeri Parr.
grisea Deshayes.
griseo-fusca Mouss.
grohmanniana Partsch.
grossa Ziegler.
guicciardi Helder.
gulo Rossm.
gustavi Boettger.
Clausilia hanleyana Pfr.
hasta Küst.
haueri Bielz.
hectica Küst.
hedenborgi Pfr.
helenæ Kleciach.
hellenica Küst.
helvola Küst.
hepatica Küst.
hetæra Friw.
heudeana Möll.
hiatula Küst.
hierosolymitana Bourg.
homalorhaphe Pfr.
hübneri Rossm.
hueti Mortill.
hyperolia Martens.
iberica Roth.
idæa Pfr.
impura Küst.
incerta Benoit.
incisa Küst.
incommoda Boettger.
inconstans Mouss.
index Mouss.
indigena Parr.
inflata Olivier.
insignis Gould.
inspersa Parr.
intermedia F. J. Schmidt.
interrupta Ziegler.
isabellina Pfr.
istriana F. J. Schmidt.
itala Martens.
itylensis Boettger.
janinensis Mouss.
japonica Cross.
javanica Bourg.
jonica Parr.
jos Benson.
josephinæ Boettger.
judaica Bourg.
jucunda Küst.
jugularis Bielz.
karsteniana Shutt.
kephissiæ Roth.
kleciachi Küst.
kobeltiana Küst.
kondourana Blanc.
kreglingeri Zelebor.
krüperi Zelebor.
küsteri Rossm.

Random Notes on Natural History.

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258 Westminster St., Providence, R. I., U. S. A.

Yelping a Gobbler.

Early in March, before the turkeys began to gobble, we had taken several by lying in wait at their roosts. But about the third week in March the gobblers were beginning to make the woods ring; and one day, at dinner, my hunting companion, Ben H— remarked to me "I reckin we might yelp up a gobbler this evenin', if you want to. I heerd one a gobblin' right smart this mornin' over on Brushy." Now Ben was a native "West Texican," born and bred in the woods, a skillful and enthusiastic hunter; and you may be sure his proposition was eagerly accepted.

Setting out about four o'clock, a two-mile walk across a rocky ridge brought us to the little dry creek, whose banks of dense chaparral and cedar brake had gained for it the name of "Brushy." A favorable location was soon secured in a thicket, in front of which and toward the neighboring mountain was an opening some fifty yards across. We lay down at full length, propped up on our elbows, behind the screen of bushes. Ben laid his gun by his side, but cautioned me to keep mine in readiness, and when I heard a gobbler at once to bring it to bear in that direction, that there might be no stir when the turkey appeared. Then he took from his pocket and put to his lips a common, slender cigar-holder, cupped his hands about the end and sounded a wonderfully perfect imitation of the turkey hen's plaintive call. At first it brought no response; then came from away off at the foot of the mountain an answering gobble. The bird was apparently a half mile away. Again the call sounded and again the gobble. This was repeated several times, the answer coming nearer and nearer, then abruptly ceasing. Ben motioned to me to be ready, then sounded the call again. Straining eyes and ears, soon we could hear the *click-thrrrr* of wings as the turkey "strutted"; and in a few moments more he advanced from behind a thicket on the opposite side of the opening — tail spread, wings dropped and head drawn proudly back as he looked about for his expected inamorata. The sunbeams glanced and flashed from his feathers; and, in my admiration, I entirely forgot our purpose in summoning him. Presence of mind was suddenly recalled by an impatient "Humph!" from Ben as he caught up his Winchester. With a sharp "*Pit*," the old gobbler had wheeled and started to rise; but my Remington dropped into position just in time, and a charge of "B" sent him flopping on to his back.

He was a splendid, huge old fellow, and, though by no means the first we had taken, yet we could not resist the impulse to sit down and gloat over him; smooth his ruffled plumage and pull his long "beard."

Ben asked if we should not go up the creek and try for another. I thought we ought to be satisfied; so we picked up our bird and started for home. And we were fully satisfied before the ranch was reached, for I verily thought that turkey could not weigh an ounce less than fifty pounds. But the scales refused to go beyond twenty-four and three-fourths; and, after all, that isn't so bad for a turkey! B.

Strange Behavior of a Blue Jay. — In Random Notes, Vol. II., No. 1, is an article about a Jay which pounced upon an English Sparrow and flew away with it. The writer asks, "did he want the sparrow for food?" I am not well acquainted with the habits of our birds, but from what I have seen of the

Blue Jay I should say he wanted the sparrow for food.

A number of years since my attention was called to a young chicken about ten days old; it was said to have been killed by one of these birds. I left the chick and a few minutes after a Blue Jay lit on it, pecked and tore at it, and soon flew with a piece of it to its nest of young not far away. The next day at noon I heard a chick making quite a noise, and on going out to see what was the matter I saw one of these birds pecking away at the head of a chick which would soon have been killed had I not come to the rescue; as it was, it died three or four days afterwards. Since then I have known of Jays attacking young chickens several times. I have noticed in every instance that the bird had young ones about ready to leave the nest.

A. A. HINKLEY.

DU BOIS, ILL.

BOHEMIAN WAXWINGS.— Among several flocks of Bohemian Waxwings at an altitude of 10,500 feet, I secured four good specimens March 23. One specimen had a very fine brown hair, eight and a half inches long, growing from each corner of the mouth. The books to which I have access make no mention of such appendages. Are they rare, or have they been unnoted before?

DEAN W. PARK.

COLORADO.

Some Early Wild Flowers.

AT this season, when the buds give promise of warmer days, every one turns with longing to the woods. Even those who, in August, are indifferent to floral beauty, and whose eyes are at times closed to everything that is not practical, become quite inspired by a spray of alder or a bud of arbutus. In every one there is an instinct, however staled by custom or choked by indolence, which leads him to the forest or the meadow. One man takes to fishing, and another to hunting, not so much for the sport often, as for the wild surroundings and the utter freedom.

Our country is so vast in its extent that the flora of one region often differs essentially from that of another. The early flowers of Colorado, most elegant of their kind, are, as a rule, quite unlike those of Rhode Island. So, in any sketch like the present, one must restrict himself to his immediate surroundings. With us the earliest flowers are those tasseled clusters which droop from alders or hazels, or the silky spikes, beloved of children, which protrude from willows. Pussy willows! we can never say too much of them. Is it because they are associated with our own or the second childhood, that they are so dear? The reader will recall how lovingly Thoreau always mentions them—his "little vegetable redeemers."

Following these almost immediately, say anywhere from the 21st of March onward, comes New England's favorite, the Mayflower, or as science calls it, the *Epigœa*. An arbutus proper it is not, but what's in a name? In this familiar sermon we shall not be precise in terminology, though striving to be accurate. Just about the city the localities of this fragrant and most lovely flower are fast vanishing. To see it in full size it is necessary to make a somewhat extended trip. But such a journey pays, when somewhere under oaks or pines, remote from gas, dust, and all city abominations, the tourist reposes on a bed of odorous blossoms.

To us, a flower that appeals more tenderly to our sympathies, and sooner kindles the spark of delight, is the hepatica or liverwort. In Rhode Island it is local, but usually abundant enough when one finds it. Perhaps for her sins, Providence is denied the immediate approach of this blue-eyed beauty. It especially loves rocky, wooded slopes. In such situations one will often find a whole troop of the laughing blossoms playing bo-peep among the leaves. It is nonsense to say that they do not enjoy the fun. Why, just see their bonny faces, dimpling with sheer merriment. To our mind's eye comes back even in mid-winter that old familiar boulder, cloaked with costly emerald velvet under which, time out of mind, we have every year sat and joyed in the liverworts. And those friends who share our pleasure, who are like them among the sons of men! Herein is one of the delights of natural science, that kindred spirits may meet and revel together.

A very lovely spring flower, and we can, in our limited space, name but a few, is the columbine. Many a people know it, as they do some dozen other things which are not, under the name of honeysuckle. Its long spurs, as every boy knows, contains honey—

but this does not warrant a misnomer. Nothing in our vernal landscape is more attractive than a craggy ridge, from the crevices of which droop the red blossoms of columbine. The foliage is delicate and clearly cut, and each flower is posed as by an artist. The plants do extremely well in cultivation, increasing in size and number of blossoms.

Among the loveliest of the spring flowers is the *Houstonia cœrulea*. It has many common names, as bluets, innocence, Quaker ladies, and Star of Bethlehem. The last title it shares with many other plants; it is only necessary for a flower to have a resemblance to a star for somebody to apply an old name to it. There is nothing like our English dearth of nomenclature. In this particular we have no fertility of resource.

Every one, in Rhode Island, certainly knows the dainty bluets. They come about the middle of April. First, we note a few struggling blossoms on grassy slopes or in sunny meadows, soon to be followed by hundreds of others, till finally each field seems to be drifted full of snow. White these little flowers appear at a distance. A nearer inspection shows them to be of a lavender blue and with a yellow eye. Many, indeed, are white, but enough are tinged to countenance the name. They are Quaker ladies, we suppose, from their lavender bonnets. The plants are only a few inches in height, delicate and graceful. Before opening the flowers droop on their pedals. As they expand, each salvaform corolla is upraised. We find groups of the bluets at slight intervals apart, each group having the peculiarity of a particular form of the flower. The next group may be quite different. Indeed, the bluet, like most of the madder family, to which it belongs, is dimorphic. The stamens and pistils are of differing length in the two forms, and each form is the complement of the other. Insects are the agents for the transmission of the pollen.

We have heard of portions of the country where our *Houstonia* is not found. It must be a tame and humdrum spring that omits their cheerful faces. As well might one banish the robin, the bluebird and the tryza. Always we would find ourselves longing for the New England woods. Far more distinctive of our region is the *Houstonia* than even the trailing arbutus.

MARCH 29, 1886. W. W. BAILEY.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XIX.

Plethodon cinereus erythronotus, Cope, (*Plethodon erythronothus*, Baird, *Salamandra erythronota*, Green). The red-backed or chestnut-backed salamander is abundantly found in our damp forests, under decaying logs and among the fallen leaves of moist slopes. The body is much smaller than that of the previous genus, and more slender. The long cylindrical tail equals in length the body from snout to the hind limbs; the entire animal sometimes measuring three and one-half inches. Sixteen to nineteen folds can be counted between the fore and hind limbs which represent as many vertebræ. The general color is dark reddish brown, more or less mottled below, and with a characteristic broad, median dorsal stripe of a chestnut color, which extends from the back of the head to the tip of the tail. The inner toes are rudimentary. When discovered in its hiding-place this animal makes little effort to escape, though it may break off its brittle tail, a member which is soon again supplied. Professor Cope considers it to be nocturnal in its habits, though it is often to be seen on cloudy days, slowly wandering over the mossy carpeting of our less frequented woods. He moreover gives to it the habit of ascending slender vegetable growths, as ferns and grasses, coiling itself often at quite an elevation in such a way that on being disturbed, by a sudden spring it leaves its perch and soon is hid away under some sheltering rock. It is also able to climb the smooth surface of a pane of glass being assisted in this by its moist abdomen.

The eggs are often to be met with by one knowing the place in which they are deposited. The cavities in decaying logs are usually selected, and the eggs to the number of a dozen suspended in a grape-like cluster. The geographical distribution of this species is less general than that of the previous form, being restricted to the more eastern portions of our country. Several varieties have been demonstrated.

Native Forest Trees of Rhode Island.

No. XIV.

BY L. W. RUSSELL.

The Hickory.— Carya — Carya alba.

THE hickories, genus *Carya*, are represented in Rhode Island by four species: *C. alba*, *C. tomentosa*, *C. porcina*, and *C. amara*. The first, *C. alba*, commonly known as the shagbark or shellbark, is found in various localities in most sections of the state, but rarely in such bodies as to form a woods of the trees as is frequently seen of the chestnuts and some kinds of oak. The tree flourishes well here and is highly prized, as it ought to be, for its wood and its fruit. It is readily distinguished from the other hickories by its bark, fruit, and leaves. Its form, also, as seen in the grouping of its limbs, is, to an experienced eye, another means of recognition. The hickories are frequently seen by walls in neglected corners and out-of-the-way places where squirrels have planted the nuts. Farmers often leave them when cutting other trees for further growth for timber, or for their fruit. When grown from a seedling where there was room for a natural spread, a shellbark is usually a picturesque object. Without any apparent cause, the limbs divide into several groups, separated by vacant spaces, giving that freedom from stiffness in shape which is the delight of landscape artists. With a general cylindrical head they are tall,— often seventy to eighty feet,— erect, and firm. The body is not large, two feet in diameter being the average for a full grown tree, but in the forest it retains its size to many feet in height.

The outer bark is a characteristic feature. Upon old trees it exfoliates and hangs often by a single attachment, in long, loose scales of an iron gray, or dark ashen color. On young trees the bark is smooth. The branches are small but exceedingly tough. The leaves which spring from beautiful flower-like scales, appear late in the season and expand to a length of eighteen or twenty inches, there being usually five leaflets obovate in shape, the odd very prominent. In autumn these turn to shades of orange, falling early. The male flowers are in long slender catkins, pendulous, three on each stalk, the middle one about twice the length of the others. The fertile flowers, which are inconspicuous, are on the ends of the recent shoots, two to four in group. The fruit is globose in shape, varying much in size and quality upon different trees, and is contained in a thick, spongy shell, which opens by four depressed seams. The nuts are yellowish white, and marked by four distinct angles. The nuts vary considerably in shape, size, and thickness of shell; some are considerably flattened, and others prolonged at the end into a prominent tip made by four angular ridges. The kernel is the best of any of our native nuts. The fruit is undoubtedly capable of great improvement by selection and cultivation. The English walnut is naturally a small, poor, thick-shelled nut, but has been wonderfully improved by cultivation. It seems reasonable to believe that the cultivation of this tree for its nuts, might be in Rhode Island a source of sure profit to persons who intelligently pursued it. Besides this, its growth for wood and timber would be sure for a high money value. The wood stands at the head for its heating value; and its agreeable odor and freedom from snapping, with its bright livid coals, render it the most desirable of all woods for an open fire. Its uses in the making of tool handles, agricultural implements, in mill work, for carriage work, etc., are such as to make a demand for the timber which is never fully supplied except at high prices. With its excellencies of toughness, elasticity, strength, and compactness should be mentioned two defects,— liability to warp and twist, and to decay readily when exposed to moisture.

This species of hickory, as well as the others named, rarely occurs north of Central New England, but is found south to the Carolinas, and frequently west to the Rocky Mountains. The hickories do not occur at all in the countries of Europe, the walnut taking the place of them there. The hickories flourish finely in Rhode Island, with the exception of localities too sandy or swampy.

The difficulties of raising plantations of this tree lie in their slow growth when young, their need of protection from cold winds until large enough to shield each other, and the impatience of farmers in waiting for a score and a half of years for a money return. But in four or five years a plantation could be thinned out for walking-sticks, always in demand, in eight years for hoop poles, for which the supply is always short, and later for numerous other uses, leaving finally the "standards" for fruit and timber.

Exit Helix, Enter—What?

[WRITTEN FOR RANDOM NOTES]

THE Academy of Natural Sciences, of Philadelphia, contains one of the largest collections of shells in the world. Figures or specimens of every known species are displayed therein in such a manner as to be readily seen and easily studied; the whole collection being artistically as well as scientifically arranged in its respective classes, orders, families, and groups. Many of the genera have also been divided and subdivided. Nevertheless, it has been deemed advisable to retain their older standard names as well as those of more recent coinage.

These later divisions are shown by printed cards placed in certain parts of the cases, following which are the special varieties of the genus to which they are supposed to refer. As a rule, however, the standard generic names or their initials are applied to all. Among Cypræa for instance, one division may read "Aricia," another "Luponia," another "Epona," and so on, but upon every card on which specimens of each group or sub-genus are glued, the original name Cypræa or its initial is written, as Cypræa Arabica, C. caurica, C. cicercula, etc. So, in the division of Helices a group card may read Mesodon, Stenotrema, or any one of the thousand other names given, yet upon every specimen label may be seen the old generic word Helix or its initial.

This is the system established by Mr. George W. Tryon, Jr., conservator of the collection, who is, without doubt, one of the most practical and best informed conchologists living. For the pleasure and perhaps profit of a few experts, it may have been advisable to break up the various well-known genera into a dozen or more varieties, each laden with some stupendous name scarcely worth the ink with which it is written, but for the mass of students the leading generic name is quite sufficient, saving, as it does, a deal of confusion if not an unnecessary cramming of the memory also. Perhaps not one conchologist in a dozen would be able to recall, if asked to do so, the characters of *Aricia* Arabica, or *Stenotrema* Leaii, though they all would probably describe them readily if referred to as *Cypræa* Arabica or *Helix* Leaii. Complications in this as in all other branches of science should therefore be studiously avoided. But few men can remember the names of even the three or four hundred standard genera alluded to. What folly then to suppose that they can acquire an inkling of the thousands of divisional terms suggested by recent writers.

Were I a Verrill or a Dall I might be more chary about airing my opinions, perhaps. As it is, I hardly dare to hint that a large percentage of these innovations seem to smack more of the gratification of personal vanity than of a desire to benefit science.

In the light of these premises, I was not a little surprised to notice in the March number of RANDOM NOTES, that my good friend, Mr. Carpenter, had decided to exclude the name Helix from his forthcoming catalogue of Rhode Island Land shells, preferring, instead, such equivocal names as Polygyra, Stenotrema, and scores of others similar in character.

Though knowing Mr. Carpenter to be a most thorough conchologist, I could not help thinking that for once his judgment had betrayed him.

Otherwise it seems impossible to believe that he would attempt the annihilation of one of the most familiar names known to science; much less that he should suppose such a result could be attained.

A sorrowful day it will be when a hundred ambiguous terms replace the word which now embraces them all.

And then, when some importunate student shall ask the meaning of each, how sad it will be to hear my friend repeat the only possible answer, "Simply a variety of Helix." JOHN FORD.

PHILADELPHIA, March 18, 1886.

SEASONABLE NOTES.—The first shad of the season taken in Warren River, Monday, April 12. Brown Thrushes arrived in the vicinity of Providence, April 14. White-bellied Swallows, April 9.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXVIII.

90. PATULA (PSEUDOHYALINA) MINUSCULA, BINNEY.

Syns.:
Helix minuscula, Binn., Ad., Reeve, Chem., Morse.
" minutalis, Morelet.
" apex, Ad., Reeve.
" lavelleana, D'Orb.
" mauriniana, "
Pseudohyalina, minuscula, Tryon, Morse.

Shell depressed-convex; epidermis whitish; whorls four, convex, not increasing rapidly in diameter, with microscopic wrinkles; suture distinct; lip simple; aperture circular; umbilicus large and deep, showing the volutions. Diameter one-tenth of an inch, height one twenty-fifth.

It inhabits from the Red River of the North to Texas and Florida, in all the states east of the Rocky Mountains. It has been quoted from California, Bermuda, Cuba, Jamaica, and Porto Rico. I have collected all the land shells of Bermuda, but never saw this species there, and do not believe that it exists in any of the islands mentioned. It is not at all common in Rhode Island, but is found in great quantities in the West. In Cincinnati it is very common in the grass and in gardens. It was described by Binney in *Jour. Bost. Soc. Nat. Hist.*, III., 453, 1840.

GENUS VALLONIA RISSO, 1826.

Shell depressed, diaphanous, umbilicated, whorls three and a half to four; aperture oblique, sub-circular; outer lip white, thickened, reflected. There are but three or four species, all minute, and are distributed all over the northern portions of Europe, Asia, and America.

This genus has received other names, as follows: Amplexus, Brown, 1827; Chilostoma, Fitz., 1833; Circinaria, Beck., 1837; Corneola, Held., 1837; Glaphyra, Albers., 1850; Lucena, Moq-Tan., 1855, etc.

91. VALLONIA MINUTA, SAY.

Syns.:
Helix pulchella, Müll., Pfr., Binn., Ad. Gld., etc.
" costata, var., Müll.
" minuta, Say, Binn., DeKay, Morse.
Vallonia minuta, Morse, Tryon, and others.

It is difficult to say whether the specific name of this shell should be minuta or pulchella. If the American shell is identical with the European species, pulchella has the precedence, as Müller named it in 1774 and Say in 1817. It does not seem possible that it could have been accidently introduced from Europe, and spread all over the United States in so short a time as this country has been known to commerce, and it seems equally improbable that the same species should have been created in both hemispheres, with a wide ocean between on both sides. It is a fact that the shells from both countries look precisely alike, but as Professor Morse has examined the tongues of many specimens of both species, and always finds a difference in the lingual dentition, and as it is probable that other differences may be observed in them, I prefer to call our American shell by Say's name. It is found under stones, on old walls, in gardens and in grass growing on the banks of rivers. I find it in Rhode Island more commonly on the under side of boards and rails in damp places than in any other situation. Dr. Perkins says it is common about the roots of elms on the college grounds at Yale. They are gregarious in their habits. I found once, about twenty clustered together under an old log and as many more on a board lying in the grass at Lime Rock, in Smithfield. In both instances the locality was very damp and must be under water a good portion of the year.

The shell is one-tenth of an inch in diameter, white or nearly colorless, translucent, with four whorls, the last spreading at the aperture like a trumpet; the lip is white, thick, and reflected; umbilicus large, showing the volutions. A strongly ribbed variety has been found in Kansas, at Cincinnati, Philadelphia, and other places. I have never seen any of this variety in Rhode Island, and have none in my collection, and should be pleased to receive specimens from any generous reader of RANDOM NOTES, who has them to spare.

GENUS STROBILA, MORSE, 1864.

Shell umbilicated, globose, conic, or depressed, obliquely and coarsely striated, smoother below; aperture lunately rounded; peristome thickened and reflected; the parietal wall and base of the last whorl each with two or more revolving lamellæ. Distribution, four species, United States, Mexico, West Indies. Set apart from Helix as a new genus, by Prof. Edward S. Morse, in *Jour. Portland Soc. Nat. Hist.*, I., 26, 1864.

92. STROBILA LABYRINTHICA, SAY.

This shell was described by Say in May, 1817, in the *Journ. Acad. Nat. Soc. Phila.*, Vol. I., p. 15. His description is not exactly correct in several particulars.

It belongs to a genus containing but four species, two of which are represented in the United States: one found only in one county of Texas, and the one under consideration, which inhabits all of eastern North America.

It is of the same size (one-tenth of an inch in height and breadth) and general appearance as Conulus chersina, described in the February number of RANDOM NOTES; a globose conic shell with six volutions. It differs from that species in having a small umbilicus, in having oblique lines or ribs at regular distances, distributed over its surface, instead of being smooth and polished as in chersina; the outer lip is thickened and reflected, and in fresh specimens has a beautiful rose tint; within the aperture on the inner lip, are seen two parallel lamellar teeth, running far back into the interior of the aperture, and resembling a miniature railroad track; farther within the aperture is a third line, only slightly raised, between the other two. Under the microscope, these three lamellar teeth are seen to be surmounted with numerous sharp spines pointing toward the aperture. It is extremely common in Rhode Island under leaves and is also found on the under side of chips in damp places.

All the other genera of this immense family of land shells, including among others Bulimus, 323 species, Bulimulus, 545 species, Buliminus, 350 species, are absent from our fauna.

Family Orthalicidæ, thirty-two species, inhabit the West Indies and tropical America.

Family Achatinidæ, sixteen genera and over five hundred species is represented in Rhode Island by the

GENUS ZUA, LEACH, 1820.

"Shell ovate-oblong, imperforate, smooth, pellucid, glistening, dark horn color; whorls rather convex; aperture less than half the total length of the shell, ovate; columella more or less truncated; peristome blunt, its margins joined by a callus."

Woodward's *Manual of the Mollusca* gives the number of species of Zua as six; Tyron recognizes nine; Morse two, and Binney but one, which inhabits all the northern portions of Europe, Asia, and America. This species was named Helix subcylindrica by Linné in 1767, and is described in European works on conchology under fifteen different specific names.

Morse observes a great difference in the lingual dentition between the American and European specimens, and considers our shell to be a distinct species. I have collected in Rhode Island, and also in the grounds of the Crystal Palace at Sydenham, Eng., and I can certainly see a difference in the appearance of the two *shells*. Our species is called

93. ZUA LUBRICOIDES, STIMP.

It is a beautifully transparent, highly polished, cylindrical shell, the size of a grain of wheat, one-third of an inch long, smoky horn color; whorls six, rounded; aperture oval; lip thickened and of a claret tint when fresh. It is so highly polished that when one attempts to pick one up, it slips out of the fingers. It is very plenty in some places, though extremely local. Say found it on the shores and islands of Lake Winnepeg and the Lake of the Woods. Gould found it at Oak Island at Chelsea, Mass., in incalculable numbers. It inhabits New England, New York, Michigan, Nebraska, Canada, and British America. I find it only in one locality in Rhode Island, under a thick bed of leaves, on the east side of a stone wall, near the Mesodon thyroides locality in Cumberland.

(To be continued.)

CHECK-LIST OF GENUS CLAUSILIA. III.

J. RITCHIE, JR.

Clausilia kutschigi Küst.
laconiæ Mouss.
lævicollis Parr.
lævissima Ziegler.
lamellata Ziegler.
lamellosa Wagner.
laminata Mont.
lampedusæ Calc.
lanceolata Boettger.
latestriata Bielz.
laxa A. Schmidt.
lederi Boettger.
lepida Westerlund.
lerosiensis Fer.
lesinensis Kutsch.
leucophryne Parr.
leucoraphe Blanc.
leucopleura Brus.
leucostemma Küst.
leucostigma Ziegler.
leucostoma Küst.
liebetruti Charp.
lineolata Helder.
lishkeana Parr.
litotes Parr.
livida Menke.
longicollis Küst.
lorraini Menke.
lowei Albers.
loxostoma Benson.
lucensis Gentil.
lunellaris Pfr.
lusitanica Bourg.
macarana Ziegler.
macedonia Rossm.
macrostoma Küst.
maculata Ziegler.
maculosa Deshayes.
madensis Fuss.
magnilabris Zelebor.
magniventris Küst.
mamotica Gulia.
maranhonensis Albers.
marcki Zelebor.
orsiniana Villa.
orthostoma Menke.
oscari Thies.
oscitans Fer.
osculans Martens.
ossetica A. Schmidt.
ovata Blanford.
oystoma Rossm.
Clausilia pachychila Ziegler.
pachystoma Küst.
pæstana Phil.
pagana Ziegler.
pancici Zelebor.
parolina Betta.
parreyssi Ziegler.
parthenia Küst.
parvula Studer.
pauli Mabill.
pellucida Pfr.
penangensis Stolickza.
penchinata Bourg.
perarata Martens.
perlucens Boettger.
perplana Boettger.
peruana Troschel.
perversa Linn.
petrina Parr.
petrosa Parr.
pfeifferi Küst.
phæniciaca Bourg.
philippiana Pfr.
piceata Ziegler.
picta Pfr.
pikermiana Roth.
pirostoma Boettger.
planilabris Rossm.
platydera Martens.
plicatula Drap.
plumbea Rossm.
pluviatilis Benson.
polita Parr.
pomatias Pfr.
porphyria Möll.
porrecta Friw.
porroi Pfr.
portensis Silva.
præclara Pfr.
proba A. Adams.
proboscidea Küst.
procera Bielz.
profuga Charp.
prophetarium Bourg.
proxima Waldf.
pruneri Ziegler.
puella Pfr.
pulchella Pfr.
pumila Ziegler.
pumiliformis Boettger.
punctulata Küst.
pustulata Küst.

Random Notes on Natural History.

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UNDER date of July, 1885, the United States Department of Agriculture issued a list of questions on "Economic Ornithology." As to whether the presence of certain species of birds were of benefit to the agriculturist, and the effect of population upon bird life.

A recent perusal of this list has led to the following random notes:

The evidence as to whether crows steal eggs so far as our personal experience goes, seems circumstantially to indicate that they do, such as observing crows about the neighborhood, and finding nests rifled afterwards. On the farm of Mr. G. M. Gray, Warren, R. I., a hen stole a nest in a piece of woods not far from the house. This was followed by an especial congregating of crows in that neighborhood, but out of regard for the hen and a financial interest in her brood, the crows were raided and frightened away several times. At another time Mr. Gray was the happy possessor of a tame crow. A brood of young chicks was confined within the circle of the rim of a cheese-box, this placed on the ground and covered with a strong netting proved a capital nursery, until these conditions were discovered by the crow, who excavated under the edge of the box, and as a luckless chick making the circuit of his prison-house fell into the pit he was seized by the legs, drawn forth, and devoured. On account of this proof of a calculating mind the crow was killed, he having previously proved his ability at stealing hens' eggs. Though I have no absolute data at hand, I am satisfied that at certain seasons crows confer some benefit on the Rhode Island farmers by eating from the fields and newly plown land beetles and insect larvæ. A little later, after the corn is planted or has sprouted to a length of about two inches, these same birds together with the crow blackbirds or purple grackles, levy toll by pulling it up. To prevent this many of the Rhode Island farmers moist their seed with thin tar, mixing it with flour or something to overcome the stickiness. In other cases strings are stretched across the fields and hung with white rags, and now and then a dead crow. The first remedy is said to be quite efficacious, the second seems to meet with varied success. In the fall, when the corn is ripe, the grackles light in considerable numbers on the stalks and quickly husk out the ears doing considerable damage after a time.

In Rhode Island we have an abundance of salt water shore with muddy flats, as well as fresh ponds and rivers. The crows are there enabled to obtain many mollusks which are palatable to them, and perhaps the abundance of this food is of much advantage, their appetite being satisfied with less need of the farmers' grain.

The common report seems to be that the English sparrow drives away bluebirds, martins, indigo buntings, &c. Certainly on and about my own premises they have multiplied seriously, and the more interesting species have appeared less frequently for the past two or three years. We have an occasional robin, vireo, and chipping sparrow, but the foreigners are in the large majority with their incessant unmusical chip; their perpetual quarrels, their unsightly nests, and the dirty evidences of their presence. I have this spring observed them pecking vigorously at the buds of my sapson apple tree, but as I did not shoot any for dissection I cannot positively say but what they found insects there.

Robins, cat-birds, and brown-thrashers, do certainly eat small fruits. At Mr. Gray's farm a nice strawberry patch is very convenient to a grape arbor, and in the shade of this arbor the filled boxes of berries were usually set away for a time as the picking went on. So sure as a box was left open, one or all three of the aforementioned would sneak in, pick out the best fruit, and even scatter it about, working well down into the box in search of choicer morsels; but for their generally good behavior and the sweet songs of the cat-birds and thrushes they were very seldom molested.

That beautiful bird the cedar waxwing eats some cherries; he also eats the canker worms; few of the birds molest the hairy lavæ, like tent caterpillars, but I have several times seen the yellow-billed cuckoo, with his whole head thrust into one of their nests doing apparently rapid execution. Mr. Charles Snow, of Taunton, is my authority for the fact that potato-beetles are eaten by the night-hawk.

The effect of settlement in Rhode Island *i. e.*, manufacturing villages principally, is certainly tending to drive away many birds, especially on account of the cutting away of the wood-land, and, in general, the abundance of enterprising boys and cats. Perhaps it is unfortunate for the birds that excellent shot-guns can be purchased at so low a figure. It is true that we have here a law (full too much of it) to protect the birds. It is, however, a dead letter, and never enforced. A little secrecy is maintained about shooting game out of season, but so soon as the closed season is over the gentleman sportsman goes forth and shoots without mercy, frequently for the gratification of killing, with no consideration of his appetite or intention of eating one-half his game. Witness the quantities of mergansers and other tough and unpalatable ducks slaughtered by hundreds, and never even picked up from where they fall. The same is true of gulls, terns, loons, grebe, and herons, never allowed to pass without trying a wing shot. I believe as many nice birds have been thus shot and thrown away as have been collected for business purposes.

Mr. James M. Southwick.

Dear Sir: Referring to Mr. William G. Smith's article on Myiadestes Townsendi, in April Random Notes on Natural History, I will say that he is mistaken regarding the first capture. The nest and *eggs* of this bird were first taken in 1874, I think. I have an account of it somewhere in my papers, but cannot find it now. In 1882 and '83, I collected twelve sets of the same species in Colorado. The bluebirds arrived here March 15. About ten days ago a pair of them excavated a hole in a dead cherry limb. To-day they have commenced carrying in material for their nest. They arrived ten days, and began nesting seven days earlier than in 1885.

Respectfully yours,
D. D. Stone.

Oswego, N. Y., April 13, 1886.

Seasonable Notes.

Early morning rambles a few miles to the north of Providence, have led to observations of new arrivals as follows: April 20, a Pine Creeping Warbler; April 26, Towhee Buntings; April 29, Black and White Creepers. (May 1, Spotted Sandpipers, at Bristol, R. I).; May 3, Nashville Warblers and Chipping Sparrows; May 4, Whip-poorwill, Wood Thrushes and Golden Crown Thrush, or Oven Bird; May 5, Catbirds; May 6, Yellow Warbler, Rose-breasted Grosbeak, Chestnut-sided and Prairie Warblers, Wilson's Thrush, Swamp Sparrows and Maryland Yellow-throats; May 7, Yellow-breasted Chats, Least Flycatchers, Redstarts, Yellow-throated Vireo, Baltimore Orioles and Tanagers; May 10, Ruby-throated Humming-bird; May 12, Great Crested Flycatcher; May 17, Indigo Buntings.

From Attleboro, Mass., a set of Red-shouldered Hawk's eggs reported April 8. April 10, a nest with two young and two eggs of Barred Owl, and on the 14th a nest with two fresh eggs; May 6, two young of the Great Horned Owl nearly ready to fly were brought to me from Scituate, R. I.; May 13, a set of Song Sparrows observed; May 18, a nest of Golden-crown Thrush not quite completed.

Newport Natural History Society.— At the annual meeting of this society held at Newport, R. I., 6th May last, there were some remarks in the curator's report as to the immense superiority of complete or even incomplete series of specimens above strange and abnormal forms which are too often presented by well-meaning donors. The importance of these remarks leads us to quote that portion of Mr. A. O'D. Taylor's report, which embodies them. They are worthy of note for all local museums where-ever contemplated. The report says: "During the twelve months under review various donations have been received, and have been regularly acknowledged in the public newspapers, so that a detailed list of donors and contributions need not be recapitulated. Objects have been presented from the various departments of mineralogy, conchology, botany, and zoölogy, while articles of ethnological and archæological interest have occasionally made their appearance. Isolated specimens, however, when selected and presented, as they often are, because of their deviation from the normal type, do not—however interesting in their peculiarities—convey the knowledge derivable from complete series of specimens which would fairly represent the links of development in groups of organic life, and the various gradations in inorganic structures. Such typical series or sets of collections are still wanted. In order that our collections should become of real value and of practical aid in the study of natural history, we must have different series of connected and related specimens; if not completed, at any rate becoming intelligently shaped towards completion. We must emerge from the rudimentary stage indicated by a random assemblage of curiosities, and aim at procuring representative series illustrative of our local fauna and flora, and of the geological formation and minerals of our neighborhood. Even at the risk of repeating the leading thought behind the suggestions of my first report, I take the liberty of urging this essential on the consideration of our members and friends."

Reptiles and Batrachians of Rhode Isand.

BY HERMON C. BUMPUS.

NUMBER XX.

Plethodon glutinosus, Baird, (*Salamandra glutinosus*, Green). The Slimy, or Blue spotted Salamander was originally described by Professor Green from a specimen captured at Pittsburg, Penn., and later on received the attention of Dr. Storer, who received a specimen from Andover, Mass.

As we have never captured the form in Rhode Island we can do no better than give the description from this latter naturalist: "Length, six inches. Whole upper part of the body of a very dark brown, thickly sprinkled with distinct light blue spots. Sides appearing quite light colored from the blue spots having become confluent. Abdomen lighter colored than the back, exhibiting the spots more numerous and distinct than the back. Head, three-quarters of an inch long; nearly half an inch wide, flattened above. Eyes very prominent; of a deep black color, widely separated from each other. Nostrils rather small. Legs, co or of the body, and spotted like it. Anterior feet, four-toed; posterior, five-toed, and unusually long. Tail, length of the body; much compressed throughout its whole extent, save the extremities, the anterior of which is circular, the posterior pointed."

The description given above agrees well with that given by later herpetologists, except that attention has been drawn to the fact that the tail becomes much compressed in alcoholic specimens, giving to it a prominent keel above and below. Indeed, so much does alcohol change the form and coloring of these soft bodied animals, that unless one is familiar with the live specimens, gross mistakes will occur in the study of those preserved.

Dr. Holbrook mentions the Blue Spotted as the most abundant salamander of North America, often several individuals being captured under the decaying bark of some prostrate log. With us it is surely an uncommon animal, and the same may be said of its distribution in Massachusetts. It is not reported from Maine, though Professor Packard assures me he has met with it in Labrador. Farther south and west it is quite abundant, and specimens have been captured in Texas and Wisconsin, showing it to be a well distributed form. Of the animal's breeding habits nothing is known.

POWDER made from the pounded flowers of differeut species of *Pyrethrum* is a deadly poison to the most of insects, while it is innocuous to man. It is now being cultivated in enormous quantities in California under the name *Buhach*. — *Canadian Science Monthly*.

Native Forest Trees of Rhode Island.

No. XV.

BY L. W. RUSSELL.

CARYA TOMENTOSA.—MOCKER-NUT HICKORY.

C. tomentosa, commonly known as the mocker-nut, is frequently seen in certain localities in Rhode Island. There are some finely developed trees of this species upon the rocky ridges in the vicinity of Diamond Hill. This tree, when well developed, is a more stately and graceful object than the shell-bark hickory. Its trunk is erect and tall, its head pyramidal in general outline, yet varying enough to avoid stiffness. The branches are of moderate size, forming sharp angles with the main stem. The bark differs from that of the shell-bark in not having long, loose scales, and being arranged in ridges made by close, deep furrows. The recent shoots are stout, terminated by large, round buds, covered with prominent downy scales. The male flowers appear upon catkins grouped in threes, three to six inches long, the middle one being the longest. The fertile flowers are small and are composed of a four-parted calyx, from which spring two ragged stamens. The leaves are conspicuously large, often twenty inches in length, and composed of seven to nine obovate, slightly serrated leaflets, downy underneath. The fruit is large, thick shelled, varying much in shape, sometims four-angled, giving rise to the name "square-nut." The kernel is small compared with the whole fruit, and although edible is far inferior to that of the shell-bark. A characteristic of the leaves, of service in identifying the tree, is their strong resinous odor, particularly when they are young. The wood has the prominent characteristics of the genus but is not easily cleft, and is not quite as tough as that of one or two other species of the genus. It is difficult to distinguish the woods of the different hickories, but the buds, leaves, fruit, and bark of the different species show characteristics sufficient for easy identification.

CARYA GLABRA.—PIG-NUT HICKORY.

C. glabra, or the pig-nut hickory, is commonly diffused in Rhode Island. It is a beautiful tree, with a shapely, cylindrical head, having a bright, glossy green foliage, erect and stately, making a fine landscape adornment. It grows in company with *C. alba* and *C. tomentosa*, but to most observers is a more attractive tree than the others. The bark is of a lighter grey than than of those described. On young trees it is broken into small ridged masses, but, generally speaking the bark is smooth. It is not uncommon to find patches of yellowish lichens upon the trunks of old trees and sometimes plates of loose bark appear as with the shell-bark. The branches are small, lower ones but slightly curved upwards; the buds small, egg-shaped and pointed. The leaves are small compared with those of the two preceding species, smooth on both sides, five to seven leaflets, sessile and narrow, tapering at both ends. The terminal one is obovate and upon a short footstalk. In autumn the leaves turn to a rich orange. Those of the shell-bark drop early and without coloring. The fruit of the *C. glabra* is fig-shaped. Wilson Flagg in his *Woods and By-Ways of New England*, says that the original name of the fruit was fig-nut," and that "pig-nut" is a corruption of the former. He thereby recommends a restoration of the name "fig-nut." It should be observed that the nuts vary much in size and shape upon different trees; but they are usually thick-shelled and smooth, and of bluish grey color. The meat is scant, difficult to get out and scarcely edible when obtained. It grows singly, or in bunches of two to four, and is very abundant. The tree grows to a large size and from the compactness, toughness, and elasticity of its wood it is highly valued as a timber tree. As fuel the wood is scarcely inferior to that of the shell-bark. There are many beautiful specimens of this tree in the vicinity of Providence and in other parts of the state.

The Topographical Survey.

"THE finance committee of the House has given a hearing upon the matter of the proposed topographical survey of the state. The plan proposed is the same as at present adopted in Massachusetts, where a survey is being made in connection with the Government." That such a survey be made is eminently desirable.

The Block Island Cod and Haddock Fishery.

Fresh cod and haddock from the Block Island fishing-grounds have arrived in Providence in large quantities in the past two weeks. During last week alone the amount landed here was over 40,000 pounds, and the receipts will probably continue quite large for two or three weeks to come, as the present season will last through the month of May. This kind of fish is caught about twenty or thirty miles southeast of Block Island, whence it is brought here and sold off the boats at the dock for four cents per pound. The fish have been of good size, have arrived here in good condition, and have sold quite readily. There are two seasons for fresh cod and haddock,— the present one, which, as before stated, will last through the month of May, and the fall season, which begins with the month of November, and continues until about the middle of December. The fish are caught in trawls. A trawl consists of a string of line that will reach from 600 to 1,000 yards. To this string lines are attached about six feet apart. On the end of each of these lines is a hook, baited with clams, fresh herring, or flounders. On each end of the long string to which the lines are attached, is an anchor, which keeps the trawl in position. A line reaches from the anchor to the top of the water, with a buoy attached to it, for the purpose of locating the trawl. A trawl 1,000 yards long usually has from 1,500 to 2,000 hooks. When two-thirds of these hooks secure a fish, the catch is considered an excellent one, and when half of them are filled it is a very good one. The fisherman after he has dropped his anchor, rows off and strings his line along with its baited hooks until he comes to the "end of his rope," when he drops another anchor with the buoy attached, and the trawl is set. It is allowed to remain in the water from four to twenty-four hours. The fishermen then go to the buoy, pull up the anchor, and haul in the line, taking the fish off as the hooks come to the surface of the water. While they take off the fish the line is allowed to go over the other side of the boat into the water, so that when they have reached the other end of the string and the last hook is hauled up, the remainder of the string of lines is already set for a new catch. This is a busy season for the Block Island fishermen, and a great many are now engaged in that kind of fishing.—*From the Sunday Journal, May 2, 1886.*

About Cleaning Oily Specimens of Lepidoptera, etc.

BY PH. FISCHER, BUFFALO, N. Y.

If a specimen becomes oily, it is generally believed that its beauty can never again be restored; but with a trifling cost and a little labor any specimen will in a short time have again its former lustre, without injury to the insect. This remedy has been tried on the most tender Diurnals, as well as on Sphinges and Noctuids. It can be used on every insect. Should a specimen be oily throughout, body and wings, it may be put in the following fluid: One part of sulphuric ether to two parts of the strongest alcohol, and left therein for about twenty-four hours. Should the specimen be very oily, another bath may have to be applied. Should this second bath, after removing the insect, be only slightly discolored, the insect may be put in the last bath, which consists of pure sulphuric ether, in which it is left a few hours only. After being taken out and partly dried, it is put on the spreading-board.

Another way of cleaning specimens, where only the wings are oily, is this: The specimen is put on the spreading-board, under side up, without fastening it in any way, and the purest spirits of turpentine poured on it to fully soak the wings, after which finely-powdered pipe clay is strewn thickly over the affected parts, and this left to dry. Should the clay, after being dry, be yellow, the oil is not all out of the wings, and the above has to be renewed. Should the clay be perfectly white after drying, it can be relied upon that every particle of the fatty matter is drawn out of the wings. To remove the clay it need a little experience, though any one can do it with a little care. Hold your specimen on the upper part of the pin, and give the pin a little jerk near the point, and the clay, being brittle, will easily fall off. After it is all removed the specimen may be brushed off with a fine camel hair-brush until clean. A specimen treated in the above ways will never again become oily.—*The Canadian Entomologist, April, 1886.*

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXIX.

SINCE writing the last chapter for the May number of RANDOM NOTES, I have received from Mr. John H. Thomson, of New Bedford, Mass., a pamphlet published by him, entitled *The Land Mollusca of Bristol County, Mass.* The portion of the county explored by him comprises the city of New Bedford, the towns of Dartmouth and Westport, together with the adjoining town of Tiverton, R. I. The climate of Tiverton, Newport, and the other towns of Southern Rhode Island, differs from that of Cumberland, Smithfield, etc., although only forty miles apart, more than many sections of the country separated by hundreds of miles. The flora, too, is very different and it is not surprising that the fauna should differ as well. In fact, Mr. Thomson has discovered in the dense woods of Tiverton, several species of land shells not before known to inhabit this state. I am sorry not to have seen this pamphlet before, as I should then have given Mr. Thomson credit for these species, and described them in their proper places. I will therefore describe those species which have been omitted up to this point in the classification, and then proceed as usual, giving him proper credit for the remaining species.

94. ZONITES (HYALINIA) NITIDA, MÜLL.

Syns.:

Helix nitida, Müller, 1774, non Gme. nor Drap.
" succinea, Studer, 1789, non Müll.
" lucida, Drap., 1805.
Helicella nitida, Risso., 1826.
Oxychilus lucidus, Fitz., 1833.
Polita lucida, Held., 1837.
Zonites lucidus, Gray, 1840.
Aplostoma nitidus, Moq-Tan., 1855.
Hyalina nitida, Tryon, 1866. W. G. Binney, 1869.

Shell depressed, moderately convex above, and concave below, brownish horn color, whorls four and a half; umbilicus moderate but deep; aperture rounded. More conical and a little larger than H. arborea, Say. Inhabits Central and Southern Europe, Great Britain, and British America.

It was first discovered in the United States by Dr. Ingalls at Greenwich, N. Y., who called it Helix hygrophila. It was afterward found to be one of the few European species common to both continents. It is known to English gardeners from its habit of infesting pine beds and orchid houses. It has until now been quoted only from Ohio and New York in this country. I have collected it at Sandusky City on the shore of Lake Erie. Mr. Thomson finds it in Tiverton, R. I., on the rocky heights west of Stafford Lake.

95. ZONITES (GASTRODONTA) MULTIDENTATA, BINNEY.

Shell depressed, yellowish horn color, thin, smooth, and pellucid; whorls six; aperture transverse, narrow; from two to four rows of five or six minute, white teeth; each are seen through the shell, radiating from the umbilicus; teeth situated far within, and the last row not visible from the aperture. Diameter one-eighth of an inch, height one-sixteenth.

Quoted from Maine, Vermont, New York, and Ohio. Mr. Thomson finds it on high ridges in Tiverton and Westport. "Very rare."

96. ZONITES (STRIATURA) FERREA, MORSE.

Shell depressed, not shining, steel gray; whorls three, rapidly enlarging; aperture large, rounded; umbilicus small and abrupt, showing all the volutions; surface minutely marked with fine revolving lines. Diameter one-tenth of an inch, height one-twentieth.

This species was discovered by Prof. E. S. Morse in Maine, and was described by him in *Proc. Portland Soc. Nat. Hist.*, I., 17, 1864. It has been found in Maine, Massachusetts, and New York. Mr. Thomson finds it on Tiverton "rocky ridge." "Very rare."

97. PATULA (PLANOGYRA) ASTERISCUS, MORSE.

Shell light brown; whorls four, banded by from twenty-five to thirty thin, transparent, prominent ribs; spire flat; suture deep; lip sharp; umbilicus large. Diameter one-sixteenth of an inch.

Discovered by Professor Morse in Maine; described in *Proc. Boston Nat. Hist.*, VI., 128, 1857. Quoted from Gaspe, C. E., Lake Superior, Hudson River, N. Y., Salem, Mass., and near Portland, Me. Morse says: "It is a rare shell, and seems confined to wet and boggy ground where spruce and pine is intermingled with alder." Mr. Thomson says: "Westport. Very rare; under dead maple leaves near swampy places."

98. PATULA (ACANTHINULA) HARPA, SAY.

Syns.:

Helix harpa, Say, 1824.
Pupa costulata, Mighels, 1844.
Bulimus harpa, Pfr., Chem., Reeve, Binney.
Zoögenetes harpa, Morse, 1864.
Zoögenetes, Morse, 1864, is a synonym of Acanthinula, Beck., 1846.

Shell ovate-conic, light horn color, thin and elastic; whorls four, the last two marked by thin prominent ribs; suture distinct; aperture nearly round; lip sharp. Length one-eighth of an inch.

This species is one of the very few exceptions among land snails in which the young are brought forth alive. They are hatched from eggs, but the eggs are retained within the parent when this takes place.

It was first discovered in the Northwest Territory, by Thomas Say, on the expedition to St. Peter's River. L. L. Thaxer has found it at Ascutney, Vt. Morse found it in various parts of Maine and it is quite common near Portland in hard wood groves. Tryon quotes it from Maine to Iowa. It is said to inhabit British America, Norway, Sweden, and Lapland. Mr. Thomson finds it in Westport and Tiverton in groves of maples among leaves and moss.

Patula (Anguispira) alternata, Say, described in the April number of RANDOM NOTES, is subject to much variety in both color and outline. A coarsely striated form, with a well-developed carina is called var. mordax, Shuttleworth, and a perfectly colorless variety called alba, Tryon, has been found by Morse in Maine, and by Currier in Michigan, while another form, smooth and never carinated, with a shining translucent epidermis, has been found in New York and called var. fergusonii, Bland. This variety has also been found by Mr. Thomson in Westport, Mass., and in Tiverton, R. I.

99. STENOTREMA MONODON, RACKETT, 1822.

Shell light russet; whorls five to six; aperture flattened; lip narrow and turned back. On the inner lip is a white tooth. The shell is covered with minute hairs which give the surface a velvety appearance. In the typical species the whorls revolve around the axis at such a distance as to leave a wide and deep umbilicus, while in a variety called fraterna, Say, they revolve close together and the reflected peristome covers the umbilicus, which in this variety is a mere perforation. It is said to inhabit the whole country east of the Rocky Mountains. Mr. Thomson finds both the typical monodon and the var. fraterna in Tiverton, R. I., in old orchards and pastures.

100. MESODON SAYII, BINNEY.

Shell depressed and thin, color shining russet; whorls five or six; aperture rounded, bordered by a narrow white lip, with a slight protecting tooth near the umbilicus. The umbilicus is open, showing all the volutions. On the inner lip is a strong white tooth. Diameter nearly one inch. It is quite a rare shell, but inhabits from Maine to Illinois and southwards to Pennsylvania, and prefers hill sides and mountains. Mr. Thomson finds it in Westport and Tiverton. Very rare, only near streams of water.

101. MESODON WHEATLEYI, BLAND.

Shell conoidally globose, thin, hirsute; whorls five and a half; aperture obliquely lunate, the parietal wall armed with a tooth; umbilical region excavated, but imperforate. Reddish horn colored, the lip rose colored. Diameter fourteen, height seven millimeters. The only localities known heretofore are the mountains in Cherokee County, N. C. Mr. Thomson finds it rare at Tiverton "rocky ridge," with Striatura ferrea, Morse, a thousand miles north of its only known locality.

(To be continued.)

THE new *Egg Checking-List*, and description of birds' nests and eggs, by Mr. Oliver Davie, unavoidably delayed for several months, is now issued. See adv. page xxiii.

CHECK-LIST OF GENUS CLAUSILIA. V.

J. RITCHIE, JR.

Clausilia pygmæa Möll.
quadriplicata Parr.
raddei Siev.
raricosta Boettger.
raymondi Bourg.
reeviana Pfr.
regalis Parr.
regularis Parr.
retusa Olivier.
robusta Küst.
rolphi Leach.
rothi Zelebor.
rotundata Parr.
rubicunda Küst.
rudis Pfr.
rufocincta Küst.
rufospira Parr.
rugicollis Ziegler.
rugilabris Mouss.
rugosa Drap.
rugulosa Küst.
rutila Küst.
saccata Küst.
sacrificata Benoit.
sancta Bourg.
sandbergeri Rossm.
sandrii Küst.
satura Ziegler.
saxatilis Parr.
saxicola Parr.
scalaris Pfr.
schmidti Pfr.
schuchi Voith.
schwerenbachi Parr.
scolopax Küst.
scopulosa Parr.
sebenicensis Vidov.
sejuncta Westerlund.
semicincta Boettger.
semicostata Küst.
semidenticulata Pfr.
semilabiata Kutsch.
semilamellata Mouss.
semirugata Ziegler.
senilis Ziegler.
septemplicata Phil.
serbica Möll.
sericata Pfr.
serrulata Middend.
shanghaiensis Pfr.
sheridani Pfr.
sieboldi Pfr.
Clausilia sieversi Mouss.
silesiaca A. Schmidt.
sirkii Parr.
slosarski Lubow.
solida Drap.
solidula Pfr.
soluta Küst.
somchetica Pfr.
sorex Küst.
soror Küst.
sororia Parr.
sowerbyana Pfr.
splendens Charp.
spratti Pfr.
stabilis Ziegler.
stenzi Rossm.
stigmatica Ziegler.
stimpsoni A. Adams.
stossichi Boettger.
straminea Parr.
straminicollis Parr.
strangulata Fer.
strauchi Boettger.
striata Pfr.
strigata Pfr.
strigillata Mühlf.
strigosa Kleciach.
striolata Parr.
strobeli Porro.
strumosa Friw.
sturmi Küst.
styriaca A. Schmidt.
subcristata Küst.
subcylindrica Ziegler.
substricta Parr.
subtilis Parr.
subulata Pfr.
subuliformis Küst.
succineata Ziegler.
sulcosa Wagner.
sumatrana Martens.
suturalis Küst.
swinhoei Pfr.
syracusana Phil.
taczanowski Lubow.
tau Boettger.
taurica Kryn.
tenella Parr.
tenedricosa Küst.
tenuicostata Pfr.
tenuilabris Rossm.
terebra Pfr.

Random Notes on Natural History.

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JAMES M. SOUTHWICK,
258 Westminster St., Providence, R. I., U. S. A.

A Visit to the Wolf Rocks.

This romantic and curious glen with its piles of gigantic boulders, called the Wolf Rocks, because they formerly, with little doubt, sheltered the wolf and other wild beasts, is situated partly in Kingston and partly in Exeter. The glen forms a deep ravine, which runs northwest and southeast, cutting across a long ridge or hill, forming one of the highest elevations in the town of Kingston. Leaving the Kingston railroad station a drive of two miles over a romantic road leads to a wood road or path to the rocks. The ravine is about fifty feet deep, the sides, especially on the north, quite deep and covered with enormous boulders, some of them ten or twelve feet in diameter. The glen is about an eighth of a mile long, and before reaching the eastern end the path makes a turn to the left and opens somewhat abruptly into an amphitheatre. Here the scene is most impressive, the side towards the northwest rising steeply some fifty or sixty feet at least, and paved with huge boulders as if cast down by Cyclopean hands. The Wolf Rocks may find their analogues in the White Mountains, but for Rhode Island presents a scene of unusual interest.

The boulders are large, not much rounded, and evidently had not traveled far from the parent rock. Some are of coarse granite, with a flesh-colored feldspar, like that quarried at Westerly; in others the feldspar is whitesh, while many of the boulders are of a dark gneiss, and there is a large boulder of white quartz some four feet in diameter.

To explain the origin of the Wolf Rocks we shall have to go back to the glacial period, a time which had such a potent influence in shaping the scenery of New England.

At the beginning of the ice age the land stood so high above the sea that Long Island Sound and Narraganset Bay were dry land. Rhode Island, as well as southern New England, out to the Elizabeth, Block, and Long Islands, was mantled in ice, a sheet some three to five hundred feet in thickness. This sheet moved slowly from a little east of north, southward, as proved by the ice marks on Mount Pleasant in Providence, and on either side of the bay south of the city. The highest elevations were worn smooth and somewhat ground down, and the huge pile of débris formed a part of the great terminal moraine of the New England portion of the continental glacier.

If from the hasty examination made under the guidance of I. G. Peckham, Esq., and the Rev. Mr. Wells, of Kingston, our impressions are correct, the ravine or gorge containing the Wolf Rocks was formed before the ice sheet. The latter moving southward, pushing before it and also, perhaps, carrying on its broad back a load of boulders broken off from the ledges to the northward, dumped some of them into the ravine, partly filling it up, while others fell in as the ice melted. Such seems to be the story of these boulders. None of them appear to have been great travelers, and it would be a pleasant task for the local geologists or summer boarders in the pleasant village of Kingston to track them to their original birthplace. At all events, they are resting in a romantic glen, one of the wildest and most picturesque spots in the state.

P.

Brown University.

—*Providence Journal.*

Mr. I. M. Thrasher reports a Yellow-crowned Night Heron shot near Tiverton, R. I., about May 1st.

Silver Gar.

Tylosurus longirostris.

About June 2d several specimens of this fish were taken in the Barney River. One was brought for my examination. It measured twenty-three and one-half inches extreme length, and a cross section of the body was an egg shaped oval, one and seven-eighths inches across the longest measure.

The name "Gar" is said to be derived from a Saxon word meaning "needle," and in the Gulf of Mexico they are called "needle fish"; the form is strongly suggestive of the name, for the jaws extend into a narrow beak, set around with sharp conical teeth, the lower jaw was three-eighths of an inch longer than the upper and measured five and one-fourth inches. This inequality is said to occur only in matured specimens.

The general color above was a dark mottled and somewhat changeable green, lighter toward the sides, and all the under parts silvery; the skin very smooth and without scales; while from a median line drawn the length of the side, fine lines or indentations pointed diagonally backward. The dorsal fin, short and small, and nearly opposite of the ventral fin.

Mr. Newton Dexter informs me that he has captured this species in the Seekonk River, and he does not consider them at all rare in Rhode Island. The general habitat is from Massachusetts Bay to the Gulf of Mexico, northern Central America and in the West Indies.*

Observers state that the Gars swim rapidly with undulatory motion near the surface of the water, and seize upon such smaller fishes as associate in shoals.

The bones are green in color, which has a tendency to make the fish unpopular for food, but the flesh is said to be of fine flavor, and on the south coast of England a kindred species is taken in large quantities and esteemed a delicacy. There are three other North American species, one of these common in Southern California.

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* *Natural History of Aquatic Animals*, Government Publication, page 458. U. S. Commissioner of Fish and Fisheries.

While collecting, about one hundred miles north of Lawrence City, Wyoming Territory, I came across an old hollow pine, which had the appearance, by having some feathers around a hole about ten feet from the ground, of being inhabited. My friend climbed up and looked in, exclaiming, "Owls or snakes, but here goes," at the same time thrusting in his arm and pulling out by the head a duck, which proved to be a female, Barrows Golden Eye (*Bucephala islandica*). She was sitting on eight eggs, green in color, of uniform shape, and measuring two and one-half by one and five-eighths, which were far advanced in incubation. Two of them had the appearance of being frozen, as the shells were cracked and the contents protruding.

The next morning, June 3d, I had to break the ice on a pond near by to procure water for our camp. That day it snowed from daylight until dark; such weather was enough to chill a china egg, and I don't wonder at an unprotected duck's egg getting nipped. W. C. Smith.

A Florida 'Possum Hunt.

My friend and I were recently from the North, and our Southern neighbors had promised to take us on a 'possum hunt; so one clear December evening, just after sundown, we started. There were six of us, and four dogs. We were well, but variously armed. One had a spade, another an axe, a third a hoe, a fourth a heavy cudgel, my friend his double-barrel, and I brought up the rear with a lantern, which proved to be as u eless as the formidable armature.

Having filled our pockets with oranges from a neigboring grove, we struck off into the "hammock," a term applied to the dense hard-wood forests as distinguished from pine land. The Southerners were disposed to regard my lantern as a superfluity, and I heard covert sneers at the "Yankee notion." To pay them I took care to hold it so that they should be as much as possible in the shadow as we stumbled through the underbrush in a long, irregular line. I secretly hoped, too, that one of them would step on a snake in the darkness, when I would come to the rescue with the light. But no such contingency occurred, and the moon rising, soon clouded my hopes.

After we had fairly got into the "hammock," the dogs were let loose, and we could hear them far away, their cries growing fainter and fainter, till, to my uneducated ears they were no longer audible. One dog showed a disposition to chase rabbits, which brought down many curses upon his head from our cracker guide. A halt was called when we reached an open space, and we were told, as our guide expressed it, that we were "gwine ter wait till the dogs done treed a 'possum."

I selected a log a little removed from the others, and with a Northerner's caution in regard to scorpions and centipedes, carefully inspected the log before trusting myself to it.

The hammocks of Florida are full of interest to a naturalist. Their fauna and flora are wonderfully varied. In the white moonlight, the trees, draped with winding sheets of "Florida Moss," looked ghostly enough to satisfy the cravings of the most supernatural. How different from our Northern forests — there, in the moonlight, every outline is clear cut, every leaf shows its shape, and the dark shadows suggest no thought of concealment,— here every decided outline is smothered by the long, gray twiners of the moss, and a shadow, as though of a unrepented sin hangs over the wood. I was gliding towards the reverie into which I am invariably drawn when in the presence of Mother Nature, when I was roughly awakened by a voice, shouting, "They've got him!" Every one was up in an instant, and then followed a wild rush of nearly a mile through the thick growth, over prostrate logs, and around "sinks," to where the dogs were yelling like mad at the foot of an immense oak — by far the largest tree in the neighborhood. A council of war was held — was it a 'possum or a 'coon; and how to get it down? It seemed to be popular opinion that if it was a 'coon, the game wasn't worth the candle, but as nothing could be seen in the thick branches, it was, of course, impossible to decide between *Didelphys* and *Procyon*.

Suddenly our guide, who had maintained a wise countenance when questioned concerning his opinion, exclaimed, "I see him!" There was a stampede to where he was standing, and six pairs of eyes greedily gazed at the tree-top. "I see him," he continued, "right onto thet fust big limb, and I reck'n its a 'possum." That settled the matter, though a young fellow did dare to remark *sotto voce*, "Derned if I reck'n its a 'possum. Never yit seed a 'possum take sich a big tree." The *ipse dixit* of the guide seemed to settle matters with the others, and the opinion of the "Northers" was, of course, not asked.

After some deliberation, and considerable "cursing" of the 'possum for choosing so big a tree, it was proposed to cut it down. After two rounds it became evident that, at the rate we were working, the tree would fall some time the next afternoon. A halt was called, and more deliberation. Finally a stout young fellow offered to climb the tree. This was something of an undertaking for the trunk was without a limb for over forty feet, and was, moreover, about twenty feet in circumference at the base. However, we felled a small oak near by against the larger, and by means of considerable "boosting," he at last reached the branches. The moon just then was obscured by clouds, so we could hardly see him, but we could hear him wondering where the "derned thing" was.

Suddenly a pistol shot from the tree-top broke the silence, then another, and another. "Got him?" No answer. Then another shot. "Got him?" Still no answer. The moon, breaking through the clouds at that instant, showed a heavy body clinging despairingly to the lowest limb. Another shot, and the body loosed its hold, and fell swiftly into the mass of excited dogs, where it would have been torn to pieces, had not the guide rushed in, and driven them off with heavy blows, and held up to our interested gaze — a 'coon!

The countenance of all dropped. I heard some one behind me exclaim, no longer *sotto voce*, "Derned if I reckon'd 'twas a 'possum. Never yit seed a 'possum take sich a big tree!"

We voted to give up the hunt that night, and turned homewards. The enterprising fellow who had worked so hard for his "'possum," slung the 'coon over his shoulder with rather a disappointed air. The last thing I heard as I turned in at our gate was, "Derned if I didn't reck'n that warn't no 'possum!" HENRY A. KELLY.

BELLEVIEU, FLA.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XXI.

Amblystoma punctatune Linn., (*Salamandra venenosa* Barton, *Salamandra sub-violacea*, Harlan). The violet colored, or spotted Salamander, though not particularly abundant, has nevertheless been many times observed by those interested in nature, attracting attention because of its considerable size and brilliant markings of yellow on an apparently black field. More specifically, the entire upper parts are of a bluish black, fading to black on the jaws and sides of the head. A violet or purple tint appears below, and extends from the chin to the top of the tail. The bright yellow or orange spots are large and oval, and are variously distributed in different individuals. Generally the head bears four or five, which appear at the back of each orbit and behind the temples, while those of the body are arranged along each side in a more or less obvious row, to extend on the tail. The limbs often bear one or two smaller spots.

In size, the Spotted Salamander is larger and more bulky than those hitherto treated. It often measures five inches in length, and I have seen a specimen that exceeded seven inches. The feet are of considerable size, and are of use in walking only, being unprovided with webs. The posterior pair are the larger, and of the five toes the third and fourth are largest. Other structural though generic peculiarities are the ossified tarsus, and caspus or ankle and wrist joints, the fish-like vertibræ, these having their centre hollowed out anteriorly and posteriorly, and the large thick tongue, attached at its base and free only along the margin. The tongue is more or less folded, the folds starting from a posteriorly placed centre, and radiating anteriorly. The lateral folds of the body are eleven in number.

This species was probably first described by an American naturalist in 1803, when Dr. Barton exhibited a living specimen before the Am. Phil. Soc., though no definite description was then drawn up. Later on it seems that some person gave an account of the animal to Rafinesque, who sent a description to Daudin, who published it in his work under the name *S. venenosa* imposed by Barton. Barton finally published his description of the animal, calling it *S. sub-violacea*, a name acknowledged by Harlan. Long before this, however, Linné had, in the Old World, described the form, and his name is that now adopted by right of priority. We thus see the confusion that may arise from the too hasty description of supposed new forms.

In its habits the present species is nocturnal, being found during the day-time hid away under rocks and decaying trees. Not unfrequently it is found in some post-hole or well, into which it has fallen, and is unable to make good its escape. If exposed to the rays of the sun it soon shrivels up and dies; indeed, so necessary is moisture to this animal, that it seems to be provided with a special series of glands from which exude, through pores in the skin, a milky fluid. These are quite readily seen in a healthy individual, on the head there being several clusters.

Crocodile — Alligator.

THE distinction between Crocodiles and Alligators is based on the shape of the head, which in the crocodile is long, tapering to a narrow snout, in the alligator flat and broad; but particularly on the fact that the long canine teeth in the lower jaw of the alligator fit into well-defined pits in the upper jaw. These are represented in the crocodile simply as notches. Our most common species is Alligator mississippiensis, and is restricted, I am informed, to the southeastern portions of the United States, while several species occur southward to South America, and a new species is lately reported from China. Crocodiles also occur in Florida, and their many representatives are found in the West Indies, South America, all over Africa, in India, and the East India Islands.

Among crocodiles in general there is a separation between the plates of the head and back, but in the Gavial found in India, and which is said to grow to be nineteen or twenty feet long, the plates are uninterrupted, and in the old males there occurs a prominent and curious swelling at the end of the nose. The prominent species in South America is called a Cayman.

Native Forest Trees of Rhode Island.

No. XVI.

BY L. W. RUSSELL.

Carya amara.—*The bitternut Hickory.*

C. amara, or the bitternut hickory, is not common in Rhode Island. There are specimens in the groves in the vicinity of Saylesville, but few which are well developed. As an ornamental tree, it is the finest of the hickories. In the open grounds favorable to its growth, it attains the height of sixty or seventy feet, with a semi-orbicular head, sometimes assuming the columnar form, stately and noble in its proportions. The limbs are lithe and slender, starting from a central stem, which tapers gradually from the roots to the top. The spray is fine, and the leaves are on stems correspondingly small. The leaflets vary from seven to eleven, and are small, narrow, unequilateral and smooth on both sides. The characteristics named give the tree an airy gracefulness, which renders it highly attractive. In the autumn the tree is still more beautiful from the rich tints of orange which appear on the foliage.

The buds show characteristics by which the tree may be readily identified. They are small, the terminal ones flattened, curved, and considerably lengthened, while the axillary ones are short and rounded.

The fruit furnishes the easiest means of identification. It is small, thin shelled, and noticeable for the winged edges of the seams. The nuts can easily be crushed in the fingers, while the meat is so bitter as to be inedible, squirrels and boys alike refusing them.

The bark is usually smooth with an occasional loose flake upon old trees. It dyes a permanent yellow, and was much used by the Indians in coloring. The wood contains the excellent qualities of the other hickories, from which it is not usually distinguished. The hickories are distinctly American, their place being taken in Europe by the walnuts.

THE BUTTERNUT.—*Juglans cinerea.*

This stately tree is closely allied to the hickories. It is a native of Rhode Island, but not common. There are a few fine native specimens in the vicinity of Stump Hill. They are also seen in the yards, or in the vicinity of old farm houses, where they have been planted for their nuts and shade. The tree does not grow nearly as dense a head as the hickories, and lacks the grace which belongs to some of them. Still, in spots where there is ample room for its wide spread, it is a very desirable tree to plant.

No one is liable to mistake the butternut for any other tree, unless it be for the black walnut, *J. nigra.* The body grows to a large size, frequently four feet in diameter. The limbs are few and stout, the branchlets being stiff to the ends. The limbs are long, the lower ones nearly horizontal. The bark is gray, smooth on young trees, somewhat ridged on old trunks. It has long been used for coloring shades of brown.

The sterile flowers are seen in May in large green catkins, six or seven inches long. The fertile flowers are upon terminal downy stalks, two to seven in a bunch. The well-known fruit ripens in October. If properly dried, it yields a sweet, edible meat, but too oily for healthfulness. The wood is light, slightly tinged with pink. It works very smooth in finishing, and is coming into high repute for cabinet work and nice inside work for dwellings. As the tree grows very rapidly, the planting of it for timber is worthy of consideration.

"THE WOODCHUCK.—Woodchuks is a very curus animal. It is made of hair and eyes and has two front teeth, and can see a man with a gun when his eyes are shut and bolted. I have seen a dog shake a woodchuk till both were black in the face. A woodchuk can snivel up his nose, show his teeth and look as homely as I can without trying. They sit on one end and eat with the other. A woodchuk can get home faster than a gun can shoot. He is round all over, except his feet which are black. When eaten they retain the flavor of their nests, and seem to be cooked without being pared. A fat woodchuk, when eat properly is no laughin' matter. They come under the head of "domestic animals," and think their ain't no place like home when a dog goes for 'em."

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXX.

FAMILY Achatinellidæ, three genera, fourteen sub-genera, and about three hundred and fifty species of beautifully colored shells, confined almost exclusively to the Sandwich Islands.

Family Cylindrellidæ, four genera, seventeen sub-genera, and over two hundred species, inhabits the West Indies and Tropical America.

Family Pupidæ, consists of eight genera, the largest of which, Clausilia, has seven hundred species, none of which inhabit the United States; the next largest, Pupa, with about four hundred species, distributed among twenty sub-genera, is represented in Rhode Island by two sub-genera, and the genus Vertigo, with one hundred species, by seven species in North America, six of which are found in or near Rhode Island.

GENUS PUPA, LAM., 1801.

Shell small, cylindrical or ovate-oblong; umbilicus slight; plicate, striate or costellate, brown horn-color; lip reflected, dentate or plicate within; columella the same, the extremities usually joined by a raised callus.

The genus is divided into nineteen sub-genera, only two of which are represented in the United States. They are Leucochila, with eight species, and Pupilla, with seventy-seven. Both of these sub-genera contain species which inhabit Rhode Island.

102. PUPA (LEUCOCHILA) ARMIFERA, SAY.

Shell cylindrical-oblong; apex obtuse; whorls six or seven, smooth, convex; aperture small; lip reflected, much thickened within; teeth four to five, the largest being bifid, starting from the body whorl, at the superior margin of the aperture; umbilicus perforated. Length, one-sixth of an inch; breadth, one-eighth.

This is the largest species of the sub-genus found in this country, and is easily distinguished by its waxen white color, and its peculiar bifid tooth. It has been quoted as abundant in the Middle and Western States, extending as far east as Vermont, where it has been found on the shores of Lake Champlain. Mr. Thomson has found it in Tiverton, R. I., near the shore of Stafford Lake. "Rare."

103. PUPA (LEUCOCHILA) CONTRACTA, SAY.

A widely distributed species, inhabiting from Maine to Florida, and westward to Iowa and Texas. It is not a very common shell in New England, but is found under the bark of decaying logs and stumps. Morse says: "Found in beech groves under bits of rotten bark." It has been found on piles of old bricks. It has six whorls, gradually tapering to a not very obtuse apex. It is of a whitish color, translucent and distinctly umbilicated. The lip is broadly reflected, and the aperture is nearly closed by four strong teeth, one of which, situated on the columella, is spoon shaped, and contracts the mouth so that it resembles a horse shoe in shape. The mouth is so filled up by these teeth that it seems strange how the animal can protrude its body at all through the irregular and minute spaces between. Its length is one-tenth of an inch, and its breadth one-twentieth.

104. PUPA (LEUCOCHILA) CORTICARICA, SAY.

Shell cylindrical, white, shining; apex obtuse; whorls five, convex with well impressed sutures; aperture small, sub-orbicular; lip reflected, white; umbilicus minute. Length, one-tenth of an inch; breadth, one-twenty-fifth. Distribution, Maine to South Carolina, and from Wisconsin to Mississippi.

Described by Say in 1817 as Odostomia corticarica, changed in 1819 to Pupa. The character of the mouth of this species varies in different individuals. Usually the lip has a single tooth on the parietal wall, near the centre, and a tooth-like enlargement near the umbilical termination of the peristome; sometimes there are two teeth on the parietal wall; in other specimens there is a tooth, not in the centre, but a little one side, and again some individuals have no teeth at all. It is found under the bark of dead trees near the ground. Mr. George Hunt of this city found quite a number of specimens in the crotch of a dead oak tree some eight or ten feet from the ground.

105. Pupa (Leucochila) Fallax, Say.

A pretty, turreted shell, gradually tapering to a somewhat pointed apex; whorls six, shining, color dusty brown; aperture less than one-third the length of the shell; lip white, expanded but not reflected; umbilicus minute; mouth destitute of teeth. Length one-fifth of an inch; breadth one-tenth.

It is very abundant in the Western States, and in some places it is a great nuisance in gardens, especially in strawberry beds. It eats both leaves and fruit. A collector in Cincinnati once picked forty specimens on one strawberry leaf. It inhabits from Nebraska to Texas, and the Middle States southward to South Carolina. It may be considered a rare shell in New England, and when found is extremely local. Adams speaks of its being found in Vermont, and Mr. Thaxter has found dead specimens in Woburn, Mass. It has been found on Martha's Vineyard, and Mr. Thomson finds it rare on the rocky ridge in Tiverton, R. I., among oak trees. I once found it in Cranston, near Providence, under somewhat peculiar circumstances. One day after a long tramp, I sat down on the grass under a *juniper* tree on the border of Cunliff's Pond; after a short time I happened to look down, and saw several objects crawling on the legs of my pants, I picked off one of them and examined it. and found it to be a specimen of L. fallax. I looked carefully among the grass around the roots of the tree but could find nothing. After quite a search in vain, I reseated myself in the same place, and in a little while commenced picking off the shells from my pants' legs, until I had secured a half-ounce bottle full. I have never seen the species in any other locality in Rhode Island.

106. Pupa (Leucochila) Rupicola, Say.

Shell cylindrical, elongated; epidermis brownish horn color; whorls six; apex obtuse; aperture oval; lip thickened within, and widely reflected; teeth five, umbilicus minute. Length one-tenth of an inch; breadth one-twenty-fifth.

It was first discovered by Thomas Say in East Florida and described in *Jour. Acad. Nat. Sci. Phila.*, II., 163, 1821, and is said to inhabit all the states east of the Mississippi River. It has not yet been found in Rhode Island to my knowledge.

107. Pupa (Pupilla) Badia, Adams.

Shell oblong, cylindrical; whorls six to seven, rounded; color light brown, faintly striated; aperture nearly circular; lip thickened; umbilicus perforate. Length one-eighth of an inch; breadth one-sixteenth.

This species was found by Professor Adams near Lake Champlain, and described by him in *Bost. Jour. Nat. Hist.*, III., 331. Mr. C. B. Fuller first discovered the species in Maine. It is very abundant in places near Portland. Mr. W. C. Cleaveland has found it on Oak Island, Chelsea, Mass. It inhabits the islands in the Gulf of St. Lawrence, and is quoted from New York. Mr. Thomson finds it in Westport and Dartmouth near the salt water, in old dead trees and stumps. This species has been confounded with P. muscorum, Linn., an European species, but is a larger shell, with a less thickened lip. Some specimens have a tooth on the parietal wall. Mr. Thomson says, not one in fifty of those collected by him has it.

108. Pupa (Pupilla) Pentodon, Say.

This is a minute shell of a spermaceti white color, though when found is generally incrusted with dirt. It is found in wet places under boards and bits of wood. Mr. Thomson finds it at the foot of trees in moss and under leaves near water holes. Although not mentioned in books as being found in such places, I have found it under piles of round stones by roadsides in the country, closely adhering to the stones. It is only one-fifteenth of an inch in length by one-fortieth in breadth, but notwithstanding its small size, it has five whorls, and an aperture armed with from four to nine teeth according to its age. The largest tooth, situated on the middle of the parietal wall, is curved to the left; at the front, nearly opposite the large tooth, is another, also slightly curved to the left. The other teeth are nearly straight.

It was described by Say in 1822, but his description is incorrect in several particulars. It inhabits from British America to Georgia, and westward to the Rocky Mountains. Common in New England.

(*To be continued.*)

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In future publications I shall use the new numbers of the A. O. U. Check-list as well as those of Ridgway's List.

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What's in a Name?

The following from the *Pawtuxet Valley Gleaner*, will serve to show how much "Patsy" knew about the "Night Hawk."

Tom-cat will not Yowl To-Night; or, The Night-Hawk's Last Adventure.

Maple Valley's sun was setting,
O'er the hill tops far away,
Flooding all the land with beauty,
At the close of one bright day;
And the last rays kissed the feathers
Of a bird so free and high,
Sailing o'er the fields and woodlands,
With his wild, discordant cry.

As he sailed so slow and stately,
In the air so cool and free,
Far below he saw the chickens
Roosting on an apple tree.
"Oh," he said, "I want my supper,"
As he winged his airy flight;
"But I cannot catch a chicken
If the tom-cat yowls to-night."

"I," he said, "am called the night-hawk,
And a lofty name I bear;
But it makes me awful hungry,
Sailing in this keen, cool air.
I am longing for my supper,
But I shall not get a bite
If the chickens are kept wakeful
By the tom-cat's yowls to-night.

"On the ground I see you prowling,
Looking for a mouse or rat,
And I'd gladly make a supper
Off you, Maple Valley cat,
If I only had the courage,
But I fear your scratch and bite.
If I dared to, I would fix you
So you would not yowl to-night.

"Ah! at last I see you're sleeping
Underneath the apple tree
Where the tender chicks are roosting,
But my victim you shall be;
Nevermore you'll squall at evening,
And the chickens put to flight,
For I'm going to devour you,
And you will not yowl to-night."

Down he flew upon the green-sward,
Where the cat a bed had found,
When the sly cat pounced upon him
And bore him down to the ground.
"Ah" the night-hawk cried, "you've tricked me,
Now I'm in a pretty plight!
I had thought to dine upon you,
So you would not yowl to-night!"

With bright hues the east was glowing,
And the moon hung in the west,
When the tom-cat ceased his labors,
And stretched on the grass to rest.
He had found the bony night-hawk
Tough to tear and hard to bite;
And oft in his sleep he murmured:
"Tom-cat will not yowl to-night."

Patsy.

Another Enemy in the Poultry Yard.

For several seasons, I have been using in my poultry yards kept for domestic use, the Plymouth Rock, and found it in every way a most satisfactory variety. But it is not my present object to "write up" any fowl of the earth or air except one which the reader must presently admit can not be painted in color of too black intensity. The spring laying season had opened and the attendant of the poultry had been very much elated by the richness of his egg harvest, when I found him one day quite dejected by the loss of his finest pullet. He said that she had been struck by a hawk some days before, and had just died from the effects of the wound. The next day he reported another case of the same kind, and the experience was repeated daily until it became both monotonous and inconvenient. Six of the best hens had been wounded and most of them were dead. The hawk theory was exploded but none more satisfactory had been suggested. We would have suspected hogs which frequented the woods adjoining the poultry yard, but the wounds were always inflicted upon only one part of the body of the hen and no corresponding impression of another set of teeth could be found. The destruction of the fowls still continued and its cause still baffled our efforts at comprehension, until one day a boy working on the farm happened to pass the fowls ranging in the woods near their yard, and discovered the enemies. The hens were running with loud screams from a flock of crows pursuing them. One crow was perched upon a large hen's back at which he was pounding and tearing with his beak in order to pluck out the feathers. When he succeeded he flew off to "feather his nest," leaving his victim with a large wound in her back, from which she was to die in a few days. The crafty wretches had insidiously obtained the confidence of their daily companions, the hens, by walking about with them in the woods and pretending to be very sociable, while in reality they were plotting their base designs of a "forced levy." Have they not proved themselves eminently worthy of the appellation "black rascals," and has such an experience ever been reported before? To me the latter was both novel and *painfully* instructive.

P. S. HUNTER.

The Poultry Monthly.

To Prepare Turtles for Skins or Mounting.

THE under shell of a turtle is called the plastron, and is joined to the upper shell on each side for a little distance which varies in the different species; therefore, a fine sharp saw is the first requisite, with which to divide as neatly as possible both of these connecting pieces of shell, then with scissors cut through the skin all around the hinder part of the plastron, as close to the plastron as possible, and yet leave an edge of skin to sew to, when making up or mounting the creature. The plastron may then be turned back like the cover to a box, the legs disjointed and skinned, as with any animal, and all the bones left in; skin the tail and take out the bone, disjoint the neck, and skin as far as possible, which will be just back of the eyes; remove the brain and the flesh back of the eyes, and the muscle in the hinder portion of the jaw. The eyes must be removed from the outside and with great care to prevent cutting the lids. It is sometimes desirable to cut through the skin on the under side of the tail for about half its length, and also through the soles of the feet or flippers, as it faciliates the turning of these members. Poison all parts thoroughly with arsenic and alum, or arsenical soap. In mounting make an internal skeleton of wire as for a mammal, and stuff with sawdust or chopped tow.

I HAVE received from Col. N. S. Goss his revised catalogue of the birds of Kansas, allowing to that state three hundred and thirty-five species, and describing with care and exactness, the eggs and the building habits of such as are positively known to breed in that state. An addition to ornithological literature of much value and interest.

Colonel Goss has followed in his arrangement and nomenclature, the A. O. U. Check-List.

Sword-fish Xiphias Gladius.

JUST at present (July 10) that little piece of Rhode Island, New Shoreham or Block Island, anchored ten miles out at sea is having high jinks over the annual appearance of sword-fish. They appear to our islanders about July 1, attracted by the usual abundance of food, which is largely mackerel, menhaden, and squid, and in fact any small fish that come in schools. The best fishing ground lies on the shoals, to the south and southeast of the island, and the sport affords a decided revenue. Many sportsmen are attracted to the island and the steamer "Ocean View" is frequently chartered by them for a day's fishing. The success is various. A report to the Providence *Journal*, July 15, states:

"Sword-fish seem to be running heavier than usual of late, most of them weighing in the neighborhood of three hundred pounds. The three taken by the 'Ocean View' Monday weighed 981 pounds dressed, and the five of Tuesday 1,395 pounds."

Another report says: "One party brought in thirteen sword-fish weighing about two hundred and fifty pounds each; while the next day fifteen were captured.

A correspondent of the Hartford *Times* writes from the island:

"This exciting fun is now at its full tide. It is splendid sport.

"The vessel is fitted with a little standing place called 'the pulpit,' down in front of the bows, outside, among the bowsprit and anchor chains. On this a harpooner stands with harpoon in hand. To this murderous iron a long, light, strong line is fastened, and to the other end of this rope is fastened an empty barrel.

"Now the sword-fish is a 'queer critter.' Whether he weighs 200 or 700 pounds, he is the same sly, ferocious, aggressive fellow, the most terrific foe a man can meet in the water, unless it is a man-eater shark, and probably the sword-fish can give even him some 'p'ints.' He is actually malicious, wantonly ugly. His sword is a bony prolongation of his snout, often three feet long, and used as he can use it, it is a terrible weapon. He can not only attack, and even kill a whale, but will always attack a man, if he can get at him, and will not seldom attack a ship — burying his sword deep in the planking and breaking it off.

"Well, our harpooner on the little 'Ocean View' being duly warned by a shout from the lookout, who has discovered a swordfish off on the weather bow, gets ready to throw his lance. The fish after filling up with mackerel — on which he feeds — floats near the surface motionless, his sharp, sickle-shaped dorsal fin alone sticking out above the water and serving to betray his position. If the boat approaches 'across his bows,' so to speak, or 'head on,' he will lie perfectly still, let it almost go over him; but you can't follow him from behind; he is suspicious of that situation, and is off. He can dart like a flash of lightning. No other fish has such power of force and swiftness in darting. It is this that makes his otherwise not strong and rather harmless sword such a formidable weapon. The harpooner throws his lance, burying it deeply in the fish; perhaps throws it almost clear through his vitals; at any rate, the strong barbed iron 'holds.' The instant the harpoon is hurled over goes the barrel, too, thrown by a person who is watching for that exact moment — for the wounded fish darts off at an incredible rate, and makes the foam and spray rise well up over the barrel. This barrel reveals his course as well as hampering him and wearying him; and one of the crew now lowers a boat and goes after him to 'play' him, draw him in, and try to exhaust him. If he can only once get a loop around the slender bottom of that widely forked mackerel tail, he is sure of landing his prey and not till then.

"One of their fish proved to be a sly coon. The man in the boat had followed him a mile or so out from the little steamer, and was 'playing' him, in the way of wearying him out, when he was puzzled at the queer conduct of the fish. The latter seemed to be limp and spiritless — the line had ceased to be 'taut,' and the interviewer thought the fish must be giving up the whole business, when like a shot from a rifled cannon, crash! came the ugly sword right through the boat's bottom. It penetrated the bottom, then passed through the tin bailing dipper that lay in a hollow reserved for that utensil, near the boat's stern, then through the plank cover, that fitted over that little cupboard in the floor, to make it flush with the rest, and striking the man on the heel, knocked him head first to the other end of the boat. His boot heel saved him from being cut. The wounded fish that performed this exploit then succeeded in drawing out his sword, leaving only some pieces of its broken edges near the end, as mementoes of the adventure. The hole thus made in the boat gave its startled occupant all he could do to 'bail out' fast enough to keep afloat; but he made signals for help, which were seen and answered by the little steamer, and, eventually, both man and swordfish were secured.

"One of these ugly swordfish last Friday, stuck his sword into the mackerel schooner 'Volunteer,' one of a fleet of mackerelmen who are fishing here, from Gloucester, Cape Ann. That fish wasn't so fortunate; his weapon proved to be firmly imbedded in the ship's bottom, and in his frantic plunging he not only broke it off, but tore out with it some of his head. He was soon after found dead; but he had given the schooner such a blow that it felt to those on board as if she had struck something that jarred her all over; and on going down into the hold to look at the bottom, there was found the sword — it had gone clear through."

The general history of the swordfish as taken from the *Natural History of Useful Aquatic Animals*, by George Brown Goode, affirms that the range is from Jamaica, latitude 18° north, to Cape Breton, latitude 47° and along the coasts of Western Europe, entering the Baltic and Mediterranean seas. The various names for the fish in different languages are simply variations on the one given it by Aristotle, the father of zoölogy, twenty-three hundred years ago, and retained until now.

"The ancient city of Siena, secluded and almost forgotten among the hills of Northern Italy, should have a peculiar interest for Americans. Here Christopher Columbus was educated, and here, in the height of his triumphs as a discoverer, he chose to deposit a memento of his first voyage across the seas. His votive offering hangs over the portal of the old collegiate church, closed for many years, and rarely visited save by some American tourists. It consists of a helmet and armor worn by the discoverer when he first planted his feet on the New World earth, his weapons, and the weapon of a warrior killed by his party when approaching the American coast — the sword of a swordfish."

There seems to be no record of this fish entering the rivers of America, though they are said to do so in Europe.

There seems to be an absence of the ordinary habits of breeding season with us. None of the fish are ever taken with eggs, and they do not associate together. Captain Ashby says they are always distant from each other at least thirty or forty feet.

Young fish are taken in the Mediterranean in the winter, that will weigh from one-half to twelve pounds, but the smallest reported from this locality are four feet long, including the sword, and weigh from thirty to forty pounds; the largest eight and one-half feet long, with sword, and weigh three hundred pounds gross. These fish are a light plumbeous hue, darker on the back and white on the belly.

Mitchell and DeKay state that in 1791 a specimen sixteen feet long was exhibited in New York.

The fish disappear with the month of August, and where they pass the winter is a matter of conjecture.

The sword-fish is infested with many species of invertebrate parasites, the gills, stomach, intestines, and the flesh are all subject to attack; while among the vertebrates the shark is his worst enemy.

THE great mass of mankind can only gaze and wonder; if they undertake to think, they grow listless, and soon tire out. — *Uncle Esek.*

Wild Flowers of Warwick.

THE earls of our Rhode Island Warwick, if in our coming peerage there are ever such, will we think, assume the *Rudbeckia* for their floral emblem. It is certainly a knightly if not regal ornament. And it abounds throughout the Warwick region where we spend the summer. Perhaps the less pedantic know it better by its common name of "cone flower," or better yet by the title yellow daisy. The latter is a pretty fair name for it, as popular names go. But nomenclature aside, what a magnificent creature is this weed! The centre is a chocolate-colored cone — around which radiate the long strap-shaped, orange-colored marginal flowers. Occasionally they are large enough to be mistaken for sunflowers — and in structure are finer. To us they always suggest something oriental, but as a matter of fact they are essentially western. Most of our weeds come hither from Europe; this from our own prairies. It may be that our now incessant communication with the newer states will bring us annually more and more of their indigenous plants.

The question of what constitutes a weed is of constant recurrence. The answer depends largely upon the stand-point of the observer. Whatever is troublesome is a weed, but the same thing transposed to another location may be prized as an elegant flower. In the bright little book, *On the Wing*, by Mrs. Blake, we have just read how in California they try to cultivate our too common white daisy or ox-eye. With us it is a beautiful nuisance. In return we grow in our garden the universal California poppy, (*Eschscholtzia*) for the value of its glorious yellow flowers.

On these Buttonwood plains we have often remarked there is always a preponderating yellow. The progressive series is something like this, St. John's wort in June and early July, followed by wild indigo, golden-top Aster (*Crysopsis*), sensitive plants, and in August and September a variety of golden rods. The most splendid of the latter has, in this state, almost a restricted location near Old Buttonwoods Hotel, but there it is very common. It is the *Solidago rigida* of science. The heads are larger and fuller than in any other species, and are disposed in a flat corymb of intense yellow. The plant blooms in September, and always tempts us back to our summer repose.

It is surprising what these apparently sandy plains will yield in the way of flowers. Beside the golden daisies, before referred to, there is at present a glorious display of lilies. Everywhere one finds the hand-like spike of a pale blue lobelia. A singular plant which is here very common is the colie root (*Aletris farinosa*). It has a rosette of radical leaves, oblong in shape, and straight nerved. From the centre of these rises a tall scope bearing a lot of white mealy-looking flowers. The meadow beauties are now very abundant, forming brilliant patches of rose purple. The calyx is a dark red, and is urn-shaped. The stamens have long yellow, singular-looking anthers hanging forward and opening at the top. By pressure the pollen is projected from the apical pores. This genus (*Rhexia*) is the sole representative at the North of a vast family of tropical plants, many of them large and gorgeous. They are distinctive of South America. We have found stray specimens of the ragged orchis, and of the hinged loose stripe, *Lythrum alatum*, which according to the books is here far out of range.

Two species of *polygala* are quite frequent, and one of them extremely pretty. The young student will find them hard to describe. There is a small yellow-flowered flax, the delicate blue Linaria, the daisy fleabane, and the white top aster. If we step aside into moister soil we will find many other things. Among these, the most showy are the calopozons and gozonias, both of them members of the beautiful orchis family. All of this lineage are with us terrestrial, but in the tropics their are largely air plants, gorgeous in hue and extraordinary in form. Their color and shapes are corelated with the visits of insects. As Gray says, "free lunches are never provided without a hope of recompense." The treat is the nectar or honey, the removal the transference of pollen from flower to flower.

Another little plant, forever associated with Darwin, which we here find commonly along the remains of the old horse railroad to Apponaug, is the sun dew. It is now in flower, and is perhaps, the best known of the carnivorous plants.

We see so many persons wandering aimlessly among these wild flowers, and often seeking their names in vain, that we are led to pen these few notes to aid their steps if possible. To us the process of accumulation has been a long one. Let no one suppose either that it has been easy. If there is any art worth knowing that can be so characterized, we have not met it. Botany at its best calls to-day for a large mental equipment. One should be a good classical scholar, (hence we have no quarrel, but only love, for good old Latin and Greek,) should be a good chemist and physicist, and it would be of advantage if he knows entomology. But above all he must be an observer and reasoner, seeing all things, judging all things, and open to argument and proof. W. W. B.

BUTTONWOODS, July 13.

The Growth of Unio Complanatus, Lea.

I HAD never before been able to learn how long a time it took a *Unio* to mature. There is a brook on our place, that I have dredged from one end to the other and never could find any shells but Anodonta subcylindracea, Lea, A. undulata, Say, A. fluviatilis, Lea, Sphærium striatinum, Lam, Physa heterostropha, Say, Planorbella campanulatus, Say. Now the brook runs into the Raritan River, about one and one-half miles from our place, and besides we made a small pond; the dam is three feet in height, so that no Unio could get into the pond and brook above. Oct. 30, 1881, I planted eighteen specimens of U. complanatus; they were one and one-half inches in length when I planted them. On April 29, 1883, as I was dredging this pond, to my surprise I found five Unio complanatus, and they measured over four inches in length; hardly any variation in all five. Now the brook is quite full of them, and in an hour I can get one hundred or more. As they were growing about eighteen months, they must have grown over one and one-half inches in a year.

I should like to hear if any one has observed the same development before, or knows the facts of their growth.

THOMAS MORGAN.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXXI.

GENUS VERTIGO, MÜLLER, 1774.

Shell minute, rimate, oval, frequently sinistral; apex obtuse; whorls five or six; aperture, irregular, multi-dentate; lip white, expanded.

There are about one hundred species of Vertigo distributed between four sub-genera, of which Alæa, Jeff., contains eighty-five. This is the only sub-genus represented in America. The American species are eight in number and of these, six inhabit New England. They resemble each other so closely that it is only by the teeth that they can be distinguished apart until after a long experience in working up these species. The teeth are scarcely visible to the naked eye, and require a microscope to determine their character.

Very little indeed, can be said about these minute shells. Their habits and appearance are very similar, and a scientific description of one will apply to all, excepting as regards the number of teeth, their position, etc.

109. VERTIGO (ALÆA) BOLLESIANA, MORSE.

This species was discovered in Maine and described by Prof. E. S. Morse, *Ann. N. Y. Lyc.*, VIII., 209, 1865. It was named after the Rev. E. C. Bolles, an enthusiastic conchologist, formerly curator of the department of mollusca at the Peabody Academy of Science, at Salem, Mass.

It is a very rare shell and extremely local. It has been quoted from Maine, New Hampshire, Massachusetts, New York, Norfolk, Va., and Tiverton, R. I. I have never seen it in our state, but in Rehoboth about three miles over the line in Massachusetts, I have found it on stones and leaves abundantly under a butternut tree by the side of the road. About half a mile from this locality I found others under precisely the same circumstances, but know of no other spot where they can be obtained, save under those two butternuts. The shell has four whorls, amber colored, sub-translucent; apex obtuse; within the mouth are five teeth, one prominent and a little curved, on the parietal wall; two similar ones on the columella margin, and two lamelliform, elevated teeth at the base, within the aperture. Size of shell sixty-five by thirty-five one-thousandths of an inch.

110. VERTIGO (ALÆA) GOULDII, BINNEY.

Described by Binney in *Proc. Bost. Soc. Nat. His.*, I., 105, 1843. It is of a light chestnut color, with four and a half whorls and five teeth resembling those of Bollesiana excepting that the two on the base are not lamelliform and within the aperture, but spring up from the labial margin and are shaped like the other teeth. This species is found under leaves in the woods and is found throughout New England and the Middle States. Length one thirty-second, breadth one sixty-fourth inch.

111. VERTIGO (ALÆA) MILIUM, GOULD.

Described by Dr. A. A. Gould (for whom the previous species was named) in *Jour., Bost. Soc. Nat. Hist.*, III., 401, 1840. It was first discovered at Oak Island, Chelsea, Mass., in November, 1839, after a warm rain. It is distributed from New England to Texas, but is seldom observed on account of its extreme minuteness, being even smaller than Carychium exignum. It has six teeth, two on the parietal wall, one on the middle of the left lip, one on the base of the aperture, and two on the outer lip within the mouth. It has a large and deep umbilicus, but four whorls, dark amber colored, and is the smallest species of the genus. "It is four one-hundredths of an inch in length, three one-hundredths in breadth, and weighs five one-thousandths of a grain; and this tiny shell incloses a pulsating heart, a lung, stomach, liver, and all the organs we find in the larger snails" (Morse). Found under decaying leaves in woods, and sometimes under stones in pastures. Mr. Thomson has found them in green moss hanging from white oak trees.

112. VERTIGO (ALÆA) OVATA, SAY.

Described by Thomas Say in *Jour. Acad. Nat. Sci. Phila.*, II., 375, 1822. Thin, amber colored and highly polished; whorls five; aperture semi-oval with from four to eight teeth. There are generally two and sometimes three on the parietal wall and the others are distributed around on the margin of the lip.

Vertigo ovata, or Pupa modesta as it was formerly called, is the largest of our species of this genus, being three-fortieths by one twenty-fifth of an inch. It is found only in wet places, under chips, leaves, stones, etc. I found once a large number of them at Pawtucket, in a ledge of rotten slate. By breaking off pieces of the slate, the shells were seen between the layers of the stone. It was close to a small pond and the stones and shells were quite wet.

113. VERTIGO (ALÆA) SIMPLEX, GOULD.

Described by Dr. A. A. Gould at the same time with V. milium as above. It is a smooth, light chestnut colored shell, more cylindrical in shape than the other species of the genus; apex blunt; whorls five; length one-fifteenth of an inch, breadth one-thirtieth. Its distinguishing character is its circular aperture, destitute of teeth, and its sharp lip. It is found in the woods under leaves in Canada, New England, and New York. Mr. Thomson finds it in damp places in interstices of old logs in company with H. electrina.

114. VERTIGO (ALÆA) VENTRICOSA, MORSE.

Described by E. S. Morse, *Ann. N. Y. Lyc.*, VIII., 1, 1865. Found in Maine, New Hampshire, Massachusetts, Rhode Island, and New York.

Shell umbilicate, ovate-conic, light colored, polished, apex obtuse; suture deep; whorls four; lip widely reflected, the right margin flexuose, within thickened and colored. Length seven one-hundredths, breadth forty-five one-thousandths of an inch.

Family Limacidæ. Shell rudimentary a calcareous plate, not spiral, concealed under the mantle, and covering the respiratory cavity.

Family Tebennophoridæ. Animal a slug with neither external nor internal shell.

Family Arionidæ. Animal naked, with mantle concealing a few calcareous grains representing a shell plate.

These three families all contain species which inhabit Rhode Island, but are not included in the shell-bearing mollusca.

Family Succineidæ, six genera, six subgenera and more than two hundred species, is represented in America by the genus Succinea; this is divided into five subgenera, of which two inhabit the United States. These are, Succinea restricted, to which Studer, 1830, gave the name of Tapada, and Brachyspira, Pfr., 1855. There are about forty species in this country, four of which inhabit Rhode Island.

115. SUCCINEA (TAPADA) AVARA, SAY.

This species was described by Say in the appendix to Long's second expedition to the St. Peter's River, 1822, as follows:

"Shell sub-oval, pale reddish yellow, subdiaphanous, fragile, covered with an earthy crust; whorls three, minutely wrinkled; body whorl very large; spire small; aperture sub-ovate, large, two-thirds the length of the shell. Length three-twentieths of an inch. Inhabits the Northwest Territory."

Succinea avara is now catalogued from nearly every state in the Union, east of the Rocky Mountains. It is found about the margins of muddy streams, and sheltered under loose objects in moist places, but is also found in Rhode Island, under leaves in the woods far away from any water.

The young shells have a large rounded aperture, and scarcely any spire; they are always covered with a coating of dirt. Under the glass they prove to be covered with fine hairs which collect the dirt. As they grow larger this peculiarity disappears and the shells have a deep straw color. Mr. Say's specimens evidently were not full grown, as the size of the adults is seven-twentieths of an inch, the aperture is one-half the length of the shell and the spire is quite long.

SUCCINEA (TAPADA) OBLIQUA, SAY.

This is a large, in fact, the largest American species of Succinea, being one inch in length, by three-quarters in breadth. It has never been quoted from New England by any author, but Mr. Thomson in his *Land Mollusca of Bristol County*, says: "S. obliqua, Say, Tiverton, R. I. Very variable, but generally the typical form is found in swaley places on hillsides; very nearly allied to S. ovalis, Gld." S. obliqua does *not* resemble S. ovalis, Gld., and I am inclined to think Mr. Thomson has mistaken some large specimens of S. Totteniana, Lea for the obliqua of Say. The next chapter will contain descriptions of S. ovalis, Gould, and of S. Totteniana, Lea.

(*To be continued.*)

Chemically Pure Gold.

Mr. H. F. Carpenter, gold and silver refiner, at 29 and 31 Page Street, in this city, has succeeded in producing, by a process known only to himself, a chemically pure gold for the use of photographers who wish to make their own chloride. The term "chemically pure" means a good deal. It is almost impossible to obtain anything absolutely pure in the strict meaning of the term. Fine gold, as sold by refiners and used in the manufacturing of jewelry, is not perfectly pure; it contains a trace, and sometimes a good deal more than a trace, of silver, copper, and other base metals. Its intrinsic value is $1.03 per dwt., and is sold at that price and allowed for in sweep and other waste at the same price, there being no profit whatever in selling this metal. The chemically pure gold, $\frac{1000}{1000}$ fine, Mr. Carpenter sells for $1.10 per dwt., and the article is worth its difference in price to those who desire it perfectly pure. Mr. Carpenter is a graduate of Brown University, and was the first person in the United States to refine photographic wastes. While studying chemistry at the university (in 1860), at that time a youth of eighteen, he conceived the idea of utilizing the waste from photographers, which was being thrown away, as jewelers' sweepings were some years previous. He has had a longer experience than any other person in this line (twenty-five years), and is doing business for photographers all over the country, as well as his regular business of gold and silver refining in general. He manufactures besides the chemically pure gold, a chemically pure nitrate of silver, and chloride of gold for photographic use.— *The Jeweler*, Providence, R. I.

Literary Note.

Messrs. J. B. Lippincott & Co. have in press a *Manual of North American Birds*, by the eminent ornithologist, Prof. Robert Ridgway, curator department of birds, Smithsonian Institution, Washington, D. C.

The author has had unrivalled advantages for the preparation of a treatise of this character, arising from his own field experience, as well as his connection with the National Museum, and the free access which has been granted him to various other public and private collections of birds, both in this country and Europe.

The work is to contain some four hundred and twenty-five illustrations suitably executed, and will conform to the geographical limits, classification, numeration, and nomenclature adopted by the American Ornithological Union.

We doubt not it will be one of the most important and original contributions to the literature of the subject which has ever appeared, and presume that naturalist and sportsman alike will find in it an invaluable aid.

Specimens Received since My Last Issue.

Numbers on the Left are those of the New A. O. U. List.

SKINS OF

55–670	Short-billed Gull	$3 00 to $4 00
65–681	Royal Tern	1 50 to 2 00
71–687	Arctic Tern	75 to 1 00
172a–594a	Hutchins's Goose	3 50 to 5 00
206–583	Sandhill Crane	3 50 to 5 00
335–434	Harris's Hawk	3 00
338–438	Harlan's Hawk	6 00
351–452	Gray Sea Eagle	6 00 to 7 50
252–451	Bald Eagle	6 00 to 8 00
381–411	Elf Owl	2 00 to 3 00
514–165	Evening Grosbeak	1 50 to 2 00
597–246	Blue Grosbeak	75 to 1 00
	A few extra fine Resplendent Trogons	6 00

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AN article has appeared in the *Ornithologist and Oölogist*, Vol. II., No. 8, touching upon American taxidermists, and some opinions adverse to their work, expressed by Montague Browne, F. L. S.

We are all obliged to see things from our stand-point, and I must quote my own experience, which is that, while I always order the best, I can (with a few notable exceptions,) seldom obtain European skins that average as fine as those made by my American collectors; perhaps the best are kept at home, and the seconds sent to the American market.

I freely admit that there are collectors in America who make unsightly bird and mammal skins, but the standard of quality has very much improved during the past six years, and I can produce a score of *Yankees* whose work in that direction cannot be surpassed the world over.

It has been my experience to find collectors who, from motives of economy, preferred to take the chances of ordering their supply from the cheapest possible source, or to follow the still more questionable policy of exchanges, unloading frequently the poorest stock they had to strangers, whose ability as preparators was entirely unknown. Surely such persons must not expect to obtain for themselves the best commodities.

My last and recent order from an English dealer was for a number of American skins; they were all selected from my lowest quoted price, and a dealer's discount expected beside. My best skins cannot go to Europe on such terms.

THERE are some queer problems connected with the present movement for the protection of American birds.

I note the fact that women who, from motives of utility, economy, or beauty, are inclined to wear plumes, wings, and birds upon their costumes, are especially condemned; and properly enough an appeal is made to their emotions and their gentle sympathy, to discard such ornaments. Perhaps, however, it is not commonly known that for the manufacture of a very large portion of those ornaments, the plumage of domestic fowls (dyed in colors) is freely used; also the heads, wings, etc., of domestic pigeons and game birds, otherwise waste products of our markets.

I have patiently waited for some one to appeal to the men. Audubon is said to have regretted it after he had killed a bird. It is to be doubted if some of our modern sportsmen ever regret (though they do hold stoutly and honestly to the observing of legal seasons), if they did they would be ashamed to report so frequently through well-known channels, strings of fish and bunches of birds, killed certainly for the pleasure of the slaughter, since, by a little mathematical calculation, it would seem that the requirements of the camp, the family, or family and friends, must be greatly oversupplied.

The statement has been made that the negroes of the South are killing for food, every thing they can find, mocking birds sharing the fate of other songsters, large and small. If this is true, it is most unfortunate. Yet it is possible that the food is needed in many cases. The favored residents of our cities do not need game for their sustenance, and the usual high price places it beyond the reach of the poor.

I have knowledge of hundreds of ducks, (shot in the season), and left to flutter on the water, dying and dead, because they were not fit to eat, not worth picking up, and of marsh birds killed and brought home, smelling terribly; they certainly were not eaten, and could only be used to prove that the owner had a good gun, steady nerves, and good luck.

Men will not cease to go shooting; but cannot some one with the ability to write popularly, so work upon their sensibilities that they will cease destruction within a reasonable limit; and if legitimate game is scarce, so control themselves as to husband their cartridges for another trip?

Surely the women are not alone to blame.

LOVELAND, COL., July 20, 1886.

As probably but a small percentage of your readers ever had an opportunity to scale the Old Rockies, perhaps a brief account of a trip that I have just undertaken will be of interest to some of the real lovers of nature.

On the 6th of July we hired a man and team to haul us and our outfit as far as Willow Park, which is about eight miles west of Estes Park, which lies at the foot of Long's Peak; that is as far as we could travel by wagon. The rest of the journey must be accomplished either mounted on a bronco, or on foot. I preferred the latter, as I feel safer on *terra firma*. We reached there about noon the next day, discharged our teamster, and pitched our tent, killed a few ground squirrels for supper which we disposed of with a vengeance, and soon turned in. The next morning we started out on a collecting trip. We found many species of birds but they were all in poor plumage and entirely useless for specimens. We found Williamson's red naped, Lewis', Harris', and red shafted woodpeckers, Steller's jays, black-billed magpies, robins, Arctic blue birds, turtle doves, plumbeous vireos, Parkman's wrens, and a few others, and they all appeared to be breeding. We also found jack rabbits and cotton tails, woodchucks, four-striped and thirteen-striped chipmunks, and one old female dusky grouse, and a brood of about ten young. They were about as large as the eastern quail.

The next morning we started on foot to try to reach timber line, (that is the line beyond which no timber grows), which the settlers claimed to be about five miles, but they admitted they had never footed it. I thought it was nearer twenty by the time we reached it, which was accomplished in about four hours. We followed what is called the Big Thompson or old Indian trail that passes clear over the divide. I have no doubt that it was a better road when they used it than it is now, as it is almost impassable at places because of fallen logs. Within a few years there have been extensive forest fires through that section, which was a very heavily timbered tract, and the trees have fallen in all directions; this makes bad traveling. The settlers of to-day are either too indolent or have not the time the red skins had to clear, so the poor bronco had to face the music; but we had one advantage, if we could not climb over we could crawl under. The clouds looked very threatening, the thunder rolled in the distance, and by the time we reached timber line the rain commenced in good earnest. This is where, at this time of the year, you can experience a good thunder-storm at noon, almost every day. I think we have not had above six fine days in six weeks; but the storms are mostly confined to the mountains, although sometimes they get off on a tear. One man in this vicinity lost two hundred and three sheep by hail one day last week, and at least three-fifths of all the wheat crop in this county has been destroyed by the same enemy. When the storm had abated, it was time to start back to camp, so we had no opportunity to collect at all that day, although we saw several varieties of Lepidoptera new to me. The next day we started out again, and a third party accompanied us as guide, as we intended to reach the divide if possible. We packed one horse with our camping outfit, and our guide rode a second horse with guns and rifle; we had no use for the latter but then it was good company. Once in a while a fellow will meet a grizzly or a hungry mountain lion, but they won't wake up the camp if they can steal your grub without it.

We footed it, as before. The storm again set in before we had gone far, and sent us hunting for a friendly rock. It delayed us some, but we made timber line in time to put in about two hours collecting. The only birds we found were American tit-larks, broad-tailed hummers, intermediate white-crowned sparrows, and one pair of Townsend's flycatchers. The rocks around where we camped were swarming with coneys, a little animal rather smaller than a prairie dog, that kept up an incessant chattering until dark. We were camped close to the only spring near there, and that might have been the cause of their discomfiture. The pines grow stunted in this region, and as many of them were loosened from the rocks we rolled them together and built a roaring fire to keep off the inevitable mosquitoes, which were numerous and hungry, and also any hungry carnivora that might be prowling around, although they mostly exist in the imagination. We cooked and ate our supper, and turned in, and slept as only hunters can sleep. We had no opportunity to dry our bedding so we had to roll into them wet. Although we had snow banks above, below, and all around us, the air was quite mild. We were up and finished our bite before sunrise and struck for the range, leaving our horses where we camped. We traveled several miles over snow banks and grassy slopes. Where the snow had gone off, flowers of the most beautiful tints and fantastical shapes were blooming in profusion, and the whole air was enriched with their fragrance. What a contrast, to gather a beautiful bouquet with one hand and snow with other at the same time! We found one pair of old ptarmigans with a brood of five young. They all scrambled into the rocks and hid on our approach, but the poor little fellows had to hand over their mite as a contribution to science, which they did reluctantly. We also found one single male adult, and one male dusky grouse.

We collected some fine specimens of Lepidoptera on the road and they obliged us to retrace our steps, and kept our legs and insect nets busy until we reached camp. Everything was there but the horses, but we found them within a mile; soon had them packed, and started down the hill, reaching the bottom, tired and hungry, about sun-down.

At the foot of the trail there is a pile of rocks covering about a quarter of an acre, and rising nearly perpendicular about fifteen feet. It stands on an almost level piece of ground surrounded with heavy timber on three sides. The man that owns the ground called my attention to it. He said it was an old fort, and although he had lived there several years he had but recently discovered it as such. I started to look it over, expecting to find another Cardiff giant or Silver Lake serpent got up for the job. But I found it had been a stronghold of no mean proportions; whether it had been fortified by whites or red skins I cannot answer. On the top of the fort all around the outer edge, heavy stones were placed in courses to about three feet in height, forming a very formidable breast-work, with port holes either for arrows or rifles. Large pitch pine trees were also laid horizontally, and heavy stones placed on them, but the trees have gone to decay and ceased to hold the stones in the place where they were formerly. I searched, without avail, for several hours to discover some trace or relic of its former occupants, but on descending I found a cave on a level with the ground where there had been a fire, as the walls were thickly covered with soot and grease. There were a great many remnants of charred bone lying around, but with my small knowledge of osteology I could not decide to what class of mammalia they belonged, with the exception of the half of a lower jaw bone with all the teeth intact, which was decidedly human. I think that probably some early pioneers, closely driven by Indians, had fortified themselves there, perhaps to be starved or murdered, and their remains burnt to hide the crime; but I hope some of your readers will be able to throw more light on this dark subject.

WM. G. SMITH.

Wild Flowers of Warwick.—II.

THE very kindly reception given to our recent article upon the Warwick flowers, tempts us once again to take up the subject. From accident, rather than design, we omitted many interesting plants from our former list. There are many things attractive to the botanist alone, and in the economic sense, good for nothing. Yet one never knows when the most despised of natural products is to become useful. Even the microscopic diatoms have found their value. So, in the pursuit of pure science, the investigator often alights upon a truth. Then a chorus of surprise comes up from the private box of the critics, and a shout of "Didn't I tell you so?"

But all this is apart from the proper matter of this essay. Our "cursed spite" does not lead us, as it did the Prince of Denmark, to making straight the crooked paths, or to reforming abuses.

How did we happen to omit the wild carrot from our former article? It is among the most striking of the plants now in bloom. It will be recognized at once by its broad umbels of pure white flowers, often with a single central flower of a maroon color. These clusters as they ripen, become depressed until in the fruiting condition there results a very pretty bird's nest. Very like fine lace are the flowers of the carrot. Is its root good eating? Well, we should say, as a rule, avoid all *umbelliferœ* in a wild state. The parsnip is often dangerous. Moreover, the plaguey things all have so great a family resemblance that they may deceive the very elect. It would be a serious mistake to eat either of the hemlocks under an impression that it was a garden vegetable.

We now find on the Buttonwoods plains the smallest of the milk weeds (*Asclepias verticillata*). It is usually a foot or less in height, with narrow, whorled leaves and an umbel of small flowers, succeeded by long pods. These contain, by-and-by, the well known winged seeds of all milk weeds. Our region is rich in asclepias. We have, often along the shore, the tall common species, and in moist places everywhere the red *Asclepias iniarista*. On the sandy plains we will find, besides, the crumple-leaved *Asclepias obtusifolia*. But the really handsome one is the orange-colored butterfly weed (*Asclepias tuberosa*), very frequent along the railroad near Hill's Grove and Apponaug. It is possible that in the future the charming silk-like coma of these plants may become a commercial product. At present it serves to bear away the seeds like tiny parachutes, or to ornament parlors, or to aid Mr. Gibson as a model in some of his matchless drawings.

The first of the golden rods (*Solidago arguta*) has put in an appearance. It is a tall species with a branching wand, each portion of which is bent over and bears the heads on one side. In dry places, everywhere, the *Solidago nemonalis* will be in bloom in a few days. It is a smaller plant, with a bluish green aspect to the foliage; indeed, it has rather a dusty look. The heads are minute and not nearly so brilliant as in many other species. We notice the smaller evening primrose (*Enothera pumila*) everywhere. The large and showy one, beloved of the big mother, grows mostly near the shore. Every one knows its lemon-yellow, fragrant flowers. Let young people notice whether the stamens or the pistils are first functional. We give them this as a pretty problem.

We have spoken already of the meadow beauty (*Rhexia*) now so very conspicuous about here. From its dainty name and its habit and its proud connection we ought to like it. As a matter of fact, it is always a trial to endure a magenta shade, something of which nature is rather fond.

Related to the evening primrose is the rattle-box (*Ludwigia attennifolia*), which one will find on the old horse railroad to Apponaug, wherever it is moist. It has yellow petals — if you are up early to catch them. They are readily deciduous, but then the persistent calyx, coherent to the pod, is as lovely as a flower, It often assumes very brilliant tints of red. Perhaps it goes without saying that the popular name (which, by the way, is not distinctive), is given on account of the rattling of the seeds in the capsule.

Bindweeds have always been our admiration, and they grow very finely near the shore. Their large pink parillions are more beautiful than most morning glories. The name of this plant is *Convolvulus sepium*. The parasitic dodders, looking like coils of copper wire, are its run-down or degraded cousin. So are we in the habit of speaking of parasites in politics or in plants. By the way, do they ever *have* such in politics? The two *Spirœas* will be met with. The pink one is known the Yankee-land over as hard-hack. The white or pinkish-white one has the name of "meadow-sweet." Both are charming in a bouquet.

But, with a long vista still before us, we are exceeding our limits and tiring our readers. Better a few herbs served judiciously as *entrees* than a whole repast of vegetables. This, then, is our excuse for the peculiar character of the shore dinner here offered, as well as for the spices and condiments intermixed.

W. W. B.

BUTTONWOODS, R. I., July 23, 1886.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XXII.

5. *Amblystoma opacum* Baird, (*Salamandra opacum* Gravenhorst, *Salamandra fasciata* Green).

The Marbled or Opaque Salmander strongly resembles in outward appearance its larger congener, the Violet Colored Salamander. The two species, though the ground color of each is black, need never be confused, since the present form has the limbs comparatively feeble, allowing the animal to crawl but slowly; the head is less expanded laterally, and the body is well rounded, cylindrical, and terminated by a short tapering tail. The markings are also quite characteristic, being of a pale brown or greenish-blue shade, and appearing not as rounded spots but as transverse bands. These are often of considerable width as they leave the flanks, but become narrower as they reach the dorsal line. The eleven costal folds, the peculiar plaited tongue, and the ossified tarsus and fish-like vertebræ obtain of course in this species, as in the previous, being generic peculiarities.

The Marbled Salamander is often to be met with in wells, several specimens in the museum of Brown University having been found in drinking water. It is probable, however, that the animals were thus captured through accident, since the short, rounded tail and small, unwebbed feet do not well indicate an aquatic life. Their motions, moreover, when in the water, are slow and awkward, it apparently being an effort to keep the body right side up. It is probable that, while crawling on the damp and moss-grown stones of the curb, the unfortunate animals not infrequently lose their hold and only reach *terra firma* by making the passage of the pump.

In confinement they make perhaps a more strange than interesting pet. A box partly filled with some damp moss, such as grows in cranberry swamps, *Sphagnum*, will well please them, and so long as small insects and moisture is supplied, they will thrive. The length of five inches is seldom exceeded.

It is quite possible that in the wanderings of some person interested in herpetology there may be found within the limits of our state, the so-called Tiger Salamander or *Amblystoma tigrinum;* though Mr. Allen says that there is no positive evidence of its capture east of New York, Holbrook considered the evidence sufficient to include Massachusetts in its habitat. It is probable, however, that confusion has arisen from the strong though superficial resemblance that the present species bears to *A. punctatum.* Confusion ought not to arise, however, since the species are quite distinct. The ground color of *A. tigrinvm* is above, brown rather than black, below cinereous, the yellow spots are more numerous and smaller, and the size is often much more than that of either of the species hitherto mentioned, the length at times being over ten inches. The animal is said to like best the decaying logs of damp woods.

Pleurocera neglectum, Anthony.

FOR RANDOM NOTES.

WHILE collecting recently in the Little Muddy Creek, I found some shells of interest, that I consider to be the above specimens. When taken from the water they are covered with a ferruginous deposit, which being removed shows a polished and bright banded surface that is pleasing to the eye.

They do not agree with Mr. Anthony's description in regard to the bands. He says: "Sometimes the last whorl is encircled by two dark brown bands, of which the uppermost is also visible throughout the upper whorls."

These usually have three distinct bands on the last whorl, and two are visible on the next three or four preceding whorls; they vary from narrow and faint lines to broad and dark ones; some specimens are without bands, and the apex is eroded on nearly every shell. The species is abundant at the above locality, but not common in this vicinity. A. A. HINKLEY.

DU BOIS, ILL.

[The specimens received with the above article were Pleurocera neglectum, Anthony. ED.]

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXXII.

116. SUCCINEA (TAPADA) TOTTENIANA, LEA.

This species is found only in New England, New York, and in Canada. It was first described by Mr. Isaac Lea in the *Proceedings of the Philosophical Society*, 1841, and named after Colonel Totten, of U. S. Army, who, while stationed at Newport, R. I., discovered several new species of mollusca, in dredging in Newport Harbor. We sometimes find it in woods, but more commonly in fields, or rather in low, wet meadows, on the margins of ditches. I have found it in quite large numbers under pieces of broken limestone, at the quarries in Smithfield. The shell is obliquely ovate, of a greenish yellow color, thin and shining; whorls three; the body whorl very large, spire not prominent; suture impressed, but not so deeply as in S. avara. The size of full grown specimens is three-quarters of an inch; the size of the aperture is three-quarters the length of the shell, oval, oblique, and so open that the animal can be seen, even when contracted within the shell as much as possible. The animal is of a salmon color, and the shell is so translucent as to enable one to see the color of the viscera within.

117. SUCCINEA (BRACHYSPIRA) OVALIS, GLD.

Succinea ovalis, Gould, non Say., Ad., Bin., Pfr., Morse, Tryon.
Succinea DeCampii, Tryon.
Brachyspira ovalis, Tryon.

Thomas Say, in 1817, described a shell which he called Succinea ovalis, and in 1824 he described S. obliqua, (a western species much resembling S. totteniana,) which he afterwards proved to be identical with his S. ovalis. Dr. A. A. Gould discovered and described in the first edition of *Gould's Invertebrata of Massachusetts*, 1841, a new shell, which *he* called S. ovalis. As S. ovalis, Say, and S. obliqua, Say, are synonymous, and as authors are agreed to call it S. obliqua, the name of S. ovalis, Gld., is retained.

The shell is very delicate, fragile, highly polished, quite elastic, and so transparent as to allow all the organs of the animal to be seen through it. It is of a pale horn color, and is longer and narrower in proportion than the other species. The length of the shell is one-half an inch; of the aperture more than three-quarters the length of the shell; whorls three, the body whorl compressed; spire short but elevated and acute. Animal amber colored mottled with black dots. Inhabits the Northern and Middle States to Wisconsin.

They are generally found in wet grass, near the margins of ponds, but I have found them in Valley Pond, crawling on the stems and leaves of aquatic plants, a foot or more from the surface of the water, and several feet from the shore, rendering it necessary to wade out to them in order to collect them. How came they in such a position, when they can neither swim, nor direct their way in any manner in the water?

Family Veronicellidæ, one genus, no shell.

Family Vaginulidæ, two genera, no shell.

Family Onchididæ, four genera, no shell.

ORDER BASOMMATOPHORA.

Shell not operculated, few whorled, usually covered with a horny epidermis; animal having flattened, triangular or sub-cylindrical tentacles, contractile but *not* invertible, with eyes at their bases, sessile. There are six families of this order, two of which are represented in New England.

Family Auriculidæ contains fifteen genera, ten sub-genera, and about three-hundred and seventy species. Three of these genera, viz.: Alexia, with twenty-one species, Carychium, with fifteen, and Melampus, with one hundred and twenty species, are represented in Rhode Island by one species only.

118. ALEXIA MYOSOTIS, DRAP.

Auricula myosotis, Drap., 1801.
Carychium myosotis, Ferr., Moq.-Tan.
Auricella myosotis, Jurine.
Pythia myosotis, Beck.
Conovulus myosotis, Reeve.
Conovulus denticulatus, Forbes and Hanly.
Auricula denticulatus, Gld , DeKay.
Melampus borealis, Conrad.
Alexia Myosotis, Pfr., Morse, Tryon, W. G. Binn., etc.

Shell oval-elongated, thin, smooth, and shining; apex acute, suture distinct; whorls seven or eight, the body whorl three-fourths the length of the entire shell; aperture long and narrow; lip simple, with two or three white teeth on the inner margin. Length one-third, breadth one-eighth of an inch.

This is probably not a native species, although found in most of the sea-ports from New York to Nova Scotia. It inhabits Central and Southern Europe and the south and southwest of England, and may have been imported into this country, clinging to the sides of ships. It is quite common in Boston on old wooden wharves, where it follows the tide as it ebbs and flows.

Lieutenant Brown found it at Newport, R. I., and his specimens were described under the name of Melampus borealis, in *Silliman's Journal*, XXIII., 345, 1833. In some places it is found on isolated stones, which are submerged at high tide. It is never seen away from the vicinity of salt-water, and being an air breather, it must take in a supply of air sufficient to last during an hour or more, in which it is completely under water. It will live several days away from salt water, but becomes benumbed and dies on immersion in *fresh* water. Although common at Newport, I have never been able to find any around the wharves in Providence. Probably the water here is not clean enough for them. It is a mystery how anything can live in it or near it.

119. Carychium Exiguum, Say.

Syns.:

Pupa exigua, Say, Gld., DeKay, Adams, Binney.
Bulmimus exiguus, Binn.
Carychium exile, H. C. Lea, Troschel.
Carychium exiguum, all modern authors.

The genus Carychium is widely distributed over the north temperate portions of the earth; they are found from Siberia and Lapland as far south as Spain and Italy. One species is found in India on the shady side of mountains at an elevation of 5,000 to 9,000 feet. C. exiguum, Say, is the only species of the genus in America, and has been found in almost every state in the Union. It is a beautiful little shell, white, translucent and shining, tapering gradually to a rather obtuse apex; whorls fine, convex, very oblique, with transverse strial; aperture obliquely oval, white; lip thickened, with a slight projection on the outer margin, and another, more prominent tooth on the parietal wall. Length, one-sixteenth, breadth, one-fortieth of an inch. When the animal is moving along over the leaves the shell is carried in a horizontal position.

Binney says: "Around Boston it is found at or below the surface in swamps, growing among mosses." Morse says: "Lives in very wet and boggy places in woods." Its habitat in Rhode Island seems to be very different. On the 4th of July, 1866, the first carychium exiguum was found in Rhode Island. Twenty years ago the little village of Albion was out in the country, and over on the Cumberland side of the Blackstone, were deep thick woods. High up on the hill in the shadow of the dark woods was a stone wall running north and south; on the east side of this wall were piled heaps of dead leaves, two or three feet deep, apparently having been undisturbed for years. It was among these leaves I found more than a hundred specimens of this tiny species. The next year I again visited the spot, and obtained about twenty more. Since then the woods have been cut down, several houses built near, and the locality destroyed by hens, which have scratched the leaves all over, and probably devoured the few remaining mollusks living under them. From that time until last summer I never found another specimen, and thought no new locality would ever be discovered; but a new one has been found, and a better one that the first. In the town of Johnston, just beyond Neutaconkanut Hill, over in the woods on the left side of the road, are some ancient lime-pits, where two hundred years ago or more, somebody excavated for lime in these hills. The holes are partly full of water in winter and spring, but are dry or nearly so, and filled with dead leaves in summer, and that is the time to go and the place to find enough C. exiguum to satisfy even a collector for exchanges. (*To be continued.*)

A man who lived in the swamp daily prayed to Jupiter for health. "Pray from the hill-top, and your prayer will be granted," answered Jupiter.—*H. C. Fulton.*

The Leather-Backed Turtle.

(SPHARGIS CORIACEA.)

ABOUT the 30th of July, two schooners sailing for sword-fish in the vicinity of Southeast Point, Block Island, captured, as the correspondent of the Providence *Journal* has it, "Two large sea animals, of a variety which no one at the island has ever seen before."

That anything marine could be brought to that port and not find a name, led to some rather wild conjectures, such as the possibility of a hybrid between a seal and a turtle, a new variety of aquatic life, or even an unknown species, and the new arrivals were visited by many experts who named them everything from a gopher to a box-tortoise. The very good general description given by the *Journal* correspondent, which I take the liberty to reprint, stamped them at once as, "Luths," "Trunk Turtles," or "Leather-backed Turtles." "At length the prize was hoisted upon the deck of the schooner, where he made frantic efforts to escape and pounded heavily with his huge flukes. As he lay he measured five feet ten inches in length with his head drawn back as far as possible, with a spread of six feet eleven inches to the forward flukes or flippers, and of three feet ten inches to those next the short, blunt tail. From back to breast his body is twenty inches in diameter, and two feet six inches from side to side. His head, which resembles that of a seal in shape, with similar nostrils, skin, and weeping eyes, but lacking hairs, is nine inches wide and eight inches deep or thick just back of the eyes. The head cannot be drawn within the shell, as in the case of turtles. The upper jaw resembles that of a turtle in shape, but is cartilaginous. The lower jaw is like that of a turtle in shape, but is not hard. The neck is very full and muscular. He inflates his throat like a frog, and then expels the air after from half a minute to two or three minutes with a puffing, blowing sound. His shoulders, strong, round, and full, are twelve inches in diameter. His forward flukes are two feet six inches long, eleven inches wide, and from one-half of an inch to three inches thick. He moves them much as a bird moves its wings; indeed, the captain says he moved in the water like a bird flying rather than like a fish swimming. His strength may be judged from the fact that once, as he turned, a fluke struck a bundle of 250 shingles and sent it sliding as if it had been a feather. Instead of a shell under the body there is a kind of plate or rather strong cartilage. The shield which covers the back is suggestive of that of a turtle, but differs in two respects. It is not so hard, seeming like very hard rubber. This creature has no scales. but has its covering arranged like planks, six in number, each six inches wide, with the rear ends narrowed to conform to the shape of the animal. Instead of cracks depressed between the planks, there are ridges raised above between the longitudinal sections of the shield. There are six sections and seven ridges. The shape is almost exactly that of the shield on which the Goddess of Liberty leans on coins. His skin is mottled, a mixture of yellow, pink, and dark blue black, the last the predominant color. A few barnacles were on the neck and back. The expression of the face is mild, and he seems to be gentle in disposition, making no effort to injure those around him, but trying rather to get away."

The museum of Brown University of Providence has a specimen, taken some years since in Rhode Island waters, one has been captured near Portland, Me., and one taken in 1880 near Cape Ann, is reported to have made soup equal to that of the green turtle. Specimens will frequently weigh one thousand pounds, and their capture is reported from the temperate and tropical waters of all oceans and the Mediterranean Sea.

The creature represents in the at present accepted arrangement of zoölogical specimens, a family, a genus, and a species combined, which goes to make a good specimen a very desirable adjunct to any museum, the quoted price for such, being about $175.

They are, however, very difficult to preserve properly. In this connection it is unfortunate that these creatures, having died, were sunk in deep water, only one plastron (or back) a very useless part being retained. If it was necessary to be rid of disagreeable odors they might have been anchored just beyond low tide, for a little time, or at least the head preserved.

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258 Westminster St., Providence, R. I., U. S. A.

The Black-Footed Ferret.

While hunting one day last December, I saw some tracks in the snow, that much resembled the foot-mark of the mink, but being a long distance from water, I concluded it could not be that animal. I found it was a persistent hunter, as the tracks led to nearly every hole in a large prairie-dog town, but it had not attempted to descend into the hole at any place. The dogs are dormant the greater part of the winter, and their holes get filled on the outside with snow as was the case then. After following the tracks for a while, I gave it up. The next day I put up several steel traps, and on the following morning I was agreeably surprised to find a fine male black-footed ferret, Putorius (Cynomyonax) nigripes, in one of them. This species was named by Aud. and Bach., the word cynomyonax meaning the king of the prairie dogs, of which I have no doubt it would be if it could but catch them. The ferret is strictly nocturnal, while the prairie dog retires very early, and a dog hole is so constructed that a ferret would not venture to descend it, knowing that it could never get out again. I have now the domesticated English ferret, and have tried many times to get them into a dog hole but never could succeed.

Their holes run in the ground on an easy slope for about two feet, then drop perpendicularly for several feet, and no ferret could get out unaided. I have put a ferret into a box with several dogs in it, and it commenced slaughtering them just as if they had been so many rats.

I cannot indorse the powers of extermination recently attributed by some writers to P. nigripes, regarding their descent into the burrows of the dogs to clean them out of house and home.

I have tracked several since and have captured three, but never saw one that had attempted to enter the holes.

There are always a great many mice that live in dog holes and they are most likely the objects sought for. The last two ferrets I trapped were both killed by the swift fox while in the traps, showing that they also have more than one enemy. The male was about seventeen inches in length from the nose to the rump. The female about three inches shorter. The upper parts were of a darkish brown, under side lighter, feet, tip of tail, and forehead surrounding the eyes black. The teeth were all worn short and blunt, denoting that they were no "tenderfeet" as the Coloradians call all new settlers.

I have no doubt but the swift fox is its common enemy, as the ferret would have no show to either fight or run against it. It is evident the fox did not kill for food, but followed the natural laws of extermination.

A great deal has been written about the mutuality and brotherly love existing between the prairie dog, burrowing owl, and rattlesnake. Well, those that have seen them plying their daily avocations know as well as I do that it is all bosh. The dog is an industrious, clean house-keeper, and would never let off apartments to a dirty, slovenly, noisy owl, coming home at all hours both day and night loaded with all varieties of putrefaction, and as for the rattlesnake, he is like the process server in "Ould Ireland," when he goes in, the tenants soon get out.

I have read and heard that dogs always go down low enough for water; now here in the old Rockies, at some places, they would have to go through hundreds of feet of rock to get water. I do not believe they ever drink at all, any more than a jack rabbit does, or many other rodents.

Wm. G. Smith.

Native Forest Trees of Rhode Island.

No. XVII.

BY L. W. RUSSELL.

The American Beech. — *Fagus ferruginea.*

THE beech is indigenous to regions of temperate climate in both hemispheres. But one species is native to the United States and that is not regarded by botanists as specifically distinct from the beech of Europe and western Asia. The beech in Rhode Island is not a common tree, but is scattered sparingly in most parts of the state. Here it occurs most frequently along the cool banks of the streams, but is occasionally found elsewhere, usually among deciduous trees.

The beech, whether in the forest or upon open ground, is a singularly neat, attractive tree. When free to develop itself in open spaces, it limbs low, the lower branches forming a nearly horizontal spread, those higher gradually taking sharper angles until the whole forms a symmetrical, orbicular head of large dimensions. The limbs of such a tree are long and lithe, striking out from the centre close to each other, their combination forming the central stem of the tree. The aspect of a forest beech is in marked contrast with a "pasture" tree of this species. In a beech-growing region it is common to see wide reaches of woods almost exclusively of this tree. In such a place the trees shoot up straight and almost limbless from fifty to eighty feet, the few branches at the top meeting and mingling with each other, forming a shade which only here and there admits the sunlight. The bodies as well as the limbs are smooth in all stages of their growth. excepting that upon old trees the lower portions are generally nearly covered with a rough lichen, different patches showing a variety of dark gray shades.

The roots of the beech run very near the surface of the ground. This fact, taken with its density of shade, prevents the usual forest undergrowth of shrubs and small trees. The leaves under the trees lie in compact layers, formed year by year, decaying but slowly. Thus a forest of beech forms a sylvan scene of a remarkably neat and comely appearance.

The buds of the beech are long and pointed, and composed of closely imbricated scales covering the plaited leaves. The leaves are noticeable for the prominent midrib and parallel veins each ending in a single tooth. They are shining above and hairy when young. The young leaves contain a sub-acid juice not disagreeable to the taste. The fruit cannot be mistaken for that of any other tree. It is an oily, edible, three-cornered nut encased in a four-valved, bristly bur. These nuts vary much in size and shape upon different trees. It is probable that by proper selection and cultivation the nuts might be made valuable as an edible product. Beech woods in Europe, and in this country even, are valued as feeding-ground for swine, the nuts being known as "beech mast." The nuts when roasted form an agreeable substitute for coffee, and the oil from them furnishes in lamps a pleasant light. For the blossoms one must look among the opening tufts of leaves at the ends of the branches where they appear, the sterile ones in pretty roundish tassels, from silky stalks two inches long. The fertile flowers are in sessile bunches at the axils of the leaves. From these the burs and nuts gradually develop during the summer months, ripening and falling with the frosts of October.

The straight boles of the forest beeches are in such demand for the turner's use in making chairs, tool handles, etc., that even the valleys of the Berkshire Hills and the remoter parts of northern New England are being rapidly denuded of these trees. A noticeable characteristic of the wood is the dark color of the heart-wood as contrasted with the almost white sap-wood. The greater or less degree of the development of the heart-wood gives rise to a distinction among woodmen of the "white" and "red" beech.

Among the finest single specimens of beech known to the writer, in this state, is a wide-spreading, stately tree about a half a mile north of Silver Spring, by the bay-side. It limbs very low, and although now in midst of shrubs and trees of small growth, it must for many years have stood quite alone. There are other fine trees of the same species near by. There are also fine specimens of forest beeches in the ravines within and near by the Butler Hospital grounds. One of the most perfect models of this tree which we have ever known is upon Engineer Shedd's farm in North Kingstown. It is of imposing dimensions and shows all the distinguishing characteristics of a freely-developed tree. The beech deserves far more attention as a shade tree than it has yet received. It grows freely, has a very deep shade, is neat and clean throughout, being notably free from insects or blight. The "purple" beech is a beautiful "sport" from Germany. The fern-leaved beech is also a European sport and one of the most graceful trees grown. Altogether the beech is a noble tree.

Wild Flowers of Warwick.—III.

The middle of August brings a number of flowers peculiar to that season. Among these, one of the prettiest is the "grass of Parnassus," of popular language, or the Parnassia of science. This plant which belongs to the Saxifrage family, grows in swampy places inland or even near the shore. It has a number of smooth, radical leaves, from among which rise several one-leaved stems, bearing a solitary, large, white flower. The five petals are beautifully veined with green, and at their base there are curious forked appendages resembling filaments. It is guessed that they may have something to do with the protection of the nectaries against small, intrusive insects. In appearance, the flowers suggest some of the anemones. They are always great favorites. With them, one finds the cotton sedges, which are such excellent substitutes for birds' plumage in the hats of ladies. We wish our earnest plea would lead fashion from a cruel to an innocent custom. But we must correct our own women folk before we criticise the general public. "Aye, there's the rub!" Another curious marsh plant is the Xyris flexuosa. Seekers will know it when they find a rather tall, grass-like stem, of a brown color, supporting a brown head of scales. From this protrudes a curious, yellow, three-parted flower. Polygala sanguinea grows in similar places, with reddish or purple clover-looking heads, and roots smelling of wintergreen. Bartonia tenella is a plant of the gentian family, greenish and insignificant, of the same association. Certain plants have this habit of congregating together. Given one, we can decide upon the probable presence of the others. Where we find the cardinal we also look for the monkey-flower, the spearmint, the purple and white thoroughworts and the turtle-head. All of these are now in blossom.

It is the time for the Gerardias, of which we have many species—either yellow or purple. Many of them are known as wild fox-gloves, a rather good name, although the true fox-glove (Digitalis) is not a native. The common purple gerardia grows by waysides, the flowers too easily deciduous. A similar one loves the sea beach. The large, handsome yellow ones frequent the woods as partial parasites, by their roots it is impossible to cultivate them. Notice how their leaves blacken in dying. This is part of the diagnosis of a parasite. While speaking of such thieving plants, we should mention the dodder (Cuscuta), growing over bushes and resembling coils of copper wire. Immediately after germinating the plant cuts off connection with the earth and lays hold of some neighboring herb or shrub which thereafter is made to do its work. Hence the dodder has no leaves of its own. It possesses small white flowers in clusters. As if to foreshadow the habit of the plant, its embryo is a mere coiled radicle, without seed leaves.

Frequently as we stroll to the station across the meadows we pick up in the grass that dainty orchid, the Spiranthes gracilis, with pure white flowers twisted in a spiral around the summit of a green stem. Later there is another species with larger flowers, the Cernua, which is exquisitely fragrant. The moon-wert ferns, or Botrychia, are also just appearing in the meadows. As the groundnut, Apios tuberosa, has repeatedly been sent us for a name in the last few days, we should speak of it here. This is the pea-vine everywhere seen in copses, with close, rather globular bunches of peculiar purplish or even flesh-colored flowers, with the powerful odor of violets. It has large, edible tubers. The wild balsams, or jewel-weeds, or hunter's horns, everybody knows, the Impatieus fulva of the books. Touch-me-not is a name for the garden species. The names fairly indicate the quick, impulsive way in which the pods bursts and scatters the seeds. Most of the Geraniaceæ have some such trick, and all the genera, nearly, a different one. Readers should consult in this connection Sir John Lubbock's fascinating little book, "*Flowers, Fruit and Leaves.*" It is in the Nature Series of McMillian & Company. We are sure that it will give delight to all who peruse it, and open their eyes to many new facts. Go to the Public Library or Athenæum.

But we must draw these remarks to a close. Sam Weller tells us that the art of letter-writing consists in pulling up at the precise moment when the recipient desires more. We do not always know that point, but try to stop as near to it as possible.

W. W. B.

BUTTONWOODS, AUG. 22, 1886.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XXIII.

THE remaining Batrachians which appear in this list are those which have been observed in neighboring states, and though indigenous representatives have as yet not been captured here, a brief description has been appended that those interested may determine such forms as are likely to find their way into collections.

6. *Gyrinophilus porphyriticus* Cope (*Pseudotriton salmoneus* Baird, *Salamandra salmonea* Storer, *Salamandra porphyritica* Baird). The Salmon-colored Salamandra is supposed to be one of those forms which may be said to be everywhere uncommon. Specimens have been captured in Maine and Massachusetts, and diligent search will undoubtedly reveal the animal's presence in Rhode Island. While other Salamanders when captured make no effort at defense, the present animal is at times quite ferocious and as it is of considerable size, being four or five inches in length, and snapping savagely at its tormentors, it is, while in rage, quite a formidable little animal, though of course to man quite harmless. Another peculiarity is its fondness for cold water, enjoying cool springs rather than warm brooks, though it may be found in swamps. In the Alleghany region, among the mountains, it is quite abundant from New York south. Its name is indicative of its general coloration. Above a rich Salmon color, dark along the back, and brighter on the flanks, becoming pale below.

7. *Hemidactylium scutatum* Schlegel. The Four-toed Salamander is characterized by possessing but four toes on its posterior feet, a peculiarity which distinguishes it at once from all other Salamanders likely to occur within the state. Of the genus, it is the only species, and its habits are said to be entirely terrestrial. Why a terrestrial form should thus be deprived, and have its remaining toes reduced to mere rudiments, is difficult to explain. In its movements it is lively and even active, crawling about over decaying wood and among fallen leaves without the least sign of clumsiness. It is protectively colored, being ashy brown above, shaded and spotted with black. Below it is silvery. In length it seldom exceeds two and one-half inches. Professor Cope includes Rhode Island in the habitat of this animal, and Professor Verrill says it is not uncommon about New Haven.

Plant-Lice, Lady-Bugs, and Sparrows.

DURING the month of June many of the beautiful shade trees in our Providence streets, particularly the lindens, have been infested with numerous representatives of the family *Aphididæ*, or plant-lice. Attention to other business has prevented any careful examination of them, but there appeared to be two species, one green, the other nearly black; these last, advancing their legions into the orchards, seemed to prefer especially the cherry trees. It is well known that these pests always appear with the first opening of the leaves in spring-time, retiring only with the cold days of late autumn, and during the interim they multiply at the rate of ten or more generations, preying upon all the different parts of trees and plants, from the leaves to the roots, and doing damage beyond estimate.

In *Half Hours with Insects*, by A. S. Packard, Jr., (page 105), M. Fougard is quoted as stating that a certain species, "Puceron lanigère" produces eleven generations. Each generation averages over one hundred individuals, resulting in the following tabulation:

Generation.	Produce.
1	1 Aphis.
2	100 one hundred.
3	10,000 ten thousand.
4	1,000,000 one million.
5	100,000.000 one hundred millions.
6	10,000,000,000 ten billions.
7	1,000,000.000,000 one trillion.
8	100,000.000,000,000 one hundred trillions.
9	10,000,000,000,000,000 ten quadrillions.
10	1,000,000,000.000,000,000 one quintillion.

Again, Professor Huxley is quoted as saying that the tenth brood alone, if all its members survive the perils to which they are exposed, contains more substance than five hundred million stout men, or more than the whole population of China.

They have appeared to me especially numerous this season, and many of the leaves have blackened and curled up, while the others assumed a wet and waxy appearance, occasioned by the "honey dew," an exudation from the lice, which sprinkled the pavement, and fell into the faces of pedestrians. These insects pierce the leaves with their beaks, and eat almost continuously, which they are able to do by means of two tubes placed on the last segment of the abdomen, through which the excess of fluid passes out as the afore-mentioned honey dew.

Many flies and bees, and especially ants, were attracted to these infested trees. A history of the relations common between the ants and plant-lice is of great interest, but too long for this article.

Matters remained about in this condition until July 1, when as I was walking on Broadway, about 7 A. M., I noticed the English sparrows, executing peculiar manœuvres, running up and around the trunks of the trees like woodpeckers. At a loss to account for this, I started for the nearest tree, obtaining a good view of a sparrow, who hastily seized a whitish lump of something and flew away. I noticed also that the sparrows flattened their tails against the trees to brace or hold themselves, after the fashion of woodpeckers and creepers, and wondered how much of that food, influence, and exercise would be required to bring about the peculiar stiffness and pointed ends on the tail feathers characteristic of those birds. There were more lumps upon the trees, and it was easy to decide that they were the larvæ of some beetle, and a further examination discovered occasionally a perfect specimen. Some of these I sent to Mr. G. W. J. Angell, of New York, knowing that from his fine cabinet collection he could at once identify the species. I suggested also that this new arrival was somehow connected with, and probably predatory on, the aphidæ. His reply was as follows:

"NEW YORK, July 7, 1886.

"*Editor Random Notes:*

"The insect you send me for determination is one of our well-known coccinellidæ, (commonly called lady-birds, or lady-bugs,) Anatis 15, punctata, Oliv. In regard to its predatory character, I would state that it is a fact well known to entomologists that all the coccinellidæ and their larvæ (with the exception of Epilochna borealis, Fab., which feeds on the squash) prey on Aphidæ. See the excellent article, 'Plant Lice, their Friends and Enemies,' by Benj. D. Walsh, in *Practical Entomologist*, Vol. II., No. 4, p. 57. Coccinellidæ also prey on the eggs, larvæ, and pupæ of the Colorado potato bug (Doryphora 10, lineata, Say) see *American Entomologist*, Vol. I., No. 3, 1868, and are also the enemies of the chinch bug, see *American Entomologist*. Vol. I., No. 10, 1869. These facts are sufficient, I think, to show the great value of our coccinellidæ in the economy of nature, and hence the evil done by the English sparrow in so ruthlessly destroying our friends and benefactors, the lady-bugs."

And this brings me to what would seem to be one more link in the chain of evidence against the English sparrow.

A similar behavior by these birds was observed in other localities by Mr. Samuel Gorham and Mr. Charles Achorn. We all failed to discover that they eat the lice, but the evidence is not conclusive, as no dissections were made.

MESSRS DICKEY AND ALLEN report the recent capture at Charlestown, N. H., of an Albino Flying Squirrel (sciuroptorus volucella), the captor, a cat.

I quite frequently receive reports of the capture of squirrels, moles, birds, and small game in general, by domesticated cats.

—ED.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXXIII.

120. MELAMPUS BIDENTATUS, SAY.

Syns.:

Melampus biplicatus, Pfr.
Auricula biplicata, Desh.
Auricula cornea, Desh.
Auricula bidentata, Gld., DeKay, Kuster.
Melampus bidentatus, Say, Russell, Pfr., W. G. Binney, etc.

Shell ovate-conic; whorls five, the body whorl three-fourths the length of the shell; the others are flattened, forming a short blunt spire; suture distinct; aperture long and narrow; outer lip thin and sharp; inner lip furnished with two folds or teeth; within the outer lip are seen several ridges which do not reach to the margin. Length one-half inch by three-tenths in breadth.

It inhabits marshes on grass just below high tide. It crawls up the stems of the grass to escape the rising tide, but can bear submergence in salt water without injury. It is very common in Rhode Island though extremely rare north of Massachusetts Bay. It is found everywhere near Narragansett Bay and along the ocean shore as far south as Florida.

The young shells are usually smooth and dark brown, ornamented with two or three revolving bands. As they grow older they become eroded and the surface becomes rough and of a greyish white color. The ridges within the outer lip are not developed until the shell is fully matured so that it is rare to find a perfect specimen, *i. e.*, having the ridges and bands with the smooth surface and brown color united in one individual.

Family Otinidæ, not represented in America.

Family Limnæidæ.

The members of this large group of mollusks inhabit fresh water rivers, ponds, and ditches in all parts of the world and it is almost impossible to find any body of water, however small, which does not contain one or more species of this family. While on a visit to Germany this spring, I noticed in a small town, ditches of stagnant water standing in front of some of the houses, not over three feet in witdh, and from two or three inches to two feet in depth, evidently receptacles for the sewage of the adjoining houses, yet in these ditches were living thousands of specimens of at least seven different species of this family.

These animals although living in water are air breathers like all of the Pulmonata and therefore they are obliged to come often to the surface to obtain air. They float along on the water, with the foot or creeping disc just level with the surface, and the shell hanging down beneath. By expelling a portion of the air contained in the lungs they can immediately sink to the bottom. They lay their eggs in spring and early summer on stones and sticks in clusters surrounded by a gelatinous substance. Under the microscope we can watch day by day the development of the eggs and finally the little mollusks eating their way out of the jelly with which they are surrounded, and provided even at this time with a minute shell. Like the terrestrial mollusca, both sexes are united in each individual. All the air-breathing, fluviatile mollusca belong to this one family which is divided into four sub-families, three of which are represented in Rhode Island.

Sub-family Limnæinæ, with twelve genera is represented in Rhode Island by three genera and eight species.

121. LIMNÆA (RADIX) COLUMELLA, SAY.

Shell thin, fragile, horn colored; whorls four, longitudinally wrinkled; spire prominent, acute; suture not much impressed: aperture ovate, dilated. Mr. W. G. Binney in *Fresh Water Shells of North America*, 1865, has included (as synonymes) a dozen or more shells described by different authors at different times; some of these are undoubtedly distinct species of themselves. There is one variety, differing much from the typical species, which was originally described as new, and in my opinion ought to be considered as a separate species. The author, however, afterwards seemed disposed to regard it as a strongly marked local variety of columella, because it had never been found in any other place than the muddy pool in Cambridge where he first discovered it, and other writers since have taken his later view of the subject. This species I have found in large numbers in Rhode Island but only in one place. It was named Limnæa chalybea by Gould in *Silliman's Journal*, XXXIII., 196, 1840.

Limnæa columella as found here, resembles a succinea in color, shape, and size, although quite large ones are found in the pond at Lonsdale, near the railroad, nearly an inch in length. It is a delicate, fragile shell, almost transparent, with an aperture four-fifths the entire length of the shell, so that the whole body of the animal can be seen by looking in at the aperture. It attains the growth early in the spring. The animal is dark with small whitish spots, the tentacles are broad, pyramidal, compressed, and the eyes are small, black, and situated at the inner base of the tentacles.

The variety called chalybea is covered with a bluish-black epidermis and the interior of the shell is the same color of a little lighter shade. The shell is as thin as the typical columella, but is not so brittle and rings like hard burnt crockery. The spire is more pointed, the aperture more expanded and the fold on the inner lip more conspicuous. The locality for this variety is on the left side of the cross road from Lonsdale to the Diamond Hill road. It is an excavation containing more or less water the year round — a very dirty, stagnant pool containing all sorts of rubbish. Collectors who are susceptible to poison had better keep away from this place, as a dog wood tree grows over it, and the water in it being supplied only by the rain, and is being constantly evaporated by the sun, the pool is simply a concentrated infusion of dogwood leaves. How the mollusks stand it is a mystery, but personal experience has taught me to "keep in the middle of the road" when passing that locality.

122. LIMNÆA (LIMNOPHYSA) CAPERATA, SAY.

"Shell sub-oval, yellowish horn color; spire half the length of the mouth; apex acute; whorls slightly wrinkled across, with very numerous elevated, minute revolving lines; suture not very deeply impressed; aperture rather dilated; fold of the labium not profound. Inhabits Indiana" (Say).

"This species is found in the British possessions as far north as Hudson's Bay and through the northern tier of states from New England to Lake Superior" (W. G. Binney). Found in Rhode Island, so far as I know, only at Harris Lime Rock in Smithfield.

Professor Adams described in 1840 a new species of Limnæa which he called umbilicata, found in New Bedford, Mass. It has a large umbilicus for so small a shell, about a quarter of an inch long, while caperata has none. Mr. W. G. Binney follows Haldeman and Kuster in calling it a synonym of Limnæa caperata, but I am satisfied that it is neither a synonym nor a variety of caperata, but rather of Limnæa humilis, Say. My reason for this will be explained under the description of L. humilis.

123. LIMNÆA (LIMNOPHYSA) DESIDIOSA SAY.

This species was first found by Mr. Augustus Jessup, in Cayuga Lake and described by Say in *Journ. Acad. Nat. Sci., Phila.*, II., 169, 1821, as follows: "Shell oblong, sub-conic; whorls five, very convex, the fourth and fifth very small, the second rather larger; aperture a little longer than the spire; suture deeply indented; labium, calcareous deposit copious, not perfectly appressed at the base, but leaving a very small umbilical aperture."

It has been found from New England to Kansas, but is not common in Rhode Island. Its habitat is on the margins of pools and muddy ponds, but it may be seen on stones in the river, under the bridge at Olneyville. Its length is from one-half to seven-tenths of an inch. I have never found any in Rhode Island to exceed four-tenths of an inch.

(To be continued.)

TENNESSEE WARBLER IN RHODE ISLAND. — On the morning of Saturday, September 18, Mr. Walter Angell captured in an orchard at Centredale, Johnston, a fine specimen of the Tennessee Warbler, (*Helminthophila peregrina*). It was a single specimen in company with a flock of Pine Warblers, (*Dendroica vigorsii*). I think the species has not previously been reported for this state.

PURPLE GALLINULE.—(*Ionornis martinica*). A specimen was captured alive in Warwick, R. I., about the middle of August. The second occurrence reported for Rhode Island.

CHECK-LIST OF GENUS CLAUSILIA. VI.

J. RITCHIE, JR.

teres Olivier.
tersa Parr.
tetragonostoma Pfr.
tettelbachiana Rossm.
thebana Blanc.
theobaldi Blanford.
thermopylarum Pfr.
thessalonica Friw.
thomasiana Charp.
tiberiana Benoit.
tichobates Parr.
tinei Bourg.
torticollis Olivier.
transiens Möll.
translucida Ziegler.
tridens Chemn.
trinacrina Boettger.
tristrami Pfr.
troglodytes Parr.
tschetschenica Pfr.
tuba Hanley.
tumida Ziegler.
turgida Ziegler.
turrita Pfr.
unicristata Boettger.
unidentata Küst.
ungeri Zelebor.
urlaiensis Zelebor.
valida Pfr.
validiuscula Martens.
vallata Mouss.
varians Ziegler.
varicosta Boettger.
variegata A. Adams.
varnensis Pfr.
vasta Boettger.
ventricosa Drap.
venusta A. Schmidt.
vesicalis Friw.
vespa Gould.
vestusta Ziegler.
vibex Rossm.
vicina Fer.
villæ Möll.
vinacea Heude.
virginea Pfr.
virgo Mouss.
voithi Rossm.
waageni Stolickza.
yocohamensis Cross.
zebriola Küst.
zelebori Rossm.
zeigleri Küst.

marginata Ziegler.
marisi A. Schmidt.
maritima Kleciach.
martensi Herk.
massenæ Pot. et Mich.
masoni Theobald.
mathildæ Kleciach.
medleycotti Tristram.
meisneriana Shuttl.
mellæ Stab.
menelaus Martens.
menonia Parr.
menschendoeferi Bielz.
messenica Martens.
miles Küst.
milleri Pfr.
minuscula Parr.
mirabilis Parr.
mitylena Albers.
modesta Küst.
modesta Ziegler.
moësta Fer.
monilifera Parr.
moniziana Lowe.
montana Stenz.
monticola G-Austen.
moveletiana Blanc.
mouhoti Pfr.
mucida Ziegler.
munda Ziegler.
muralis Küst.
muriata Parr.
nævosa Fer.
nana Küst.
narentana Parr.
negropontina Pfr.
nervosa Parr.
nilssoni Westerlund.
nivea Pfr.
nobilis Pfr.
nonybarica G-Austen.
notabilis Küst.
obesa Pfr.
obeiscula Lowe.
obvoluta Friw.
oleata Rossm.
oleosa Westerlund.
olivieri Roth.
olympica Friw.
opaca Küst.
ornata Ziegler.

[This column was omitted by error from List No. IV.]

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258 Westminster St., Providence, R. I., U. S. A.

Kames in Rhode Island.

I had the pleasure of examining, last summer, two interesting examples of this rather common form of glacial deposit. They both lie in the town of Burrillville, one being on the farm of Job Ballou and the other about a mile northeast, on the farm of Isaac Steere.

The former is about half a mile in length, extending in nearly a north and south line with only slight curves. At the north end it is perhaps fifteen feet above the level of the pasture-land around, but gradually becomes higher southward until it ends abruptly with an altitude of fully fifty feet. The summit of the kame is gently rounded and just about wide enough for a railroad track. In fact the whole ridge has almost exactly the appearance of a railroad embankment.

At the north end an excavation has been made sufficient to show the character of the materials. It seemed to be of mixed sand and gravel similar to most of our modified drift, and having in places the oblique lamination often seen in banks of such material.

This kame is on the side of a gently sloping tract of country, and has a little stream a few hundred yards to the westward. The greater part of it lies in open pasture-land, and on this account its extent and regular shape arrest the eye from quite a distance.

The other is very similar in general extent and conformation, but lies mostly in in the woods, and is less easily examined. At its northern extremity it seems to widen out and enclose a large and very regular sink-hole. This is perhaps forty feet in depth and as regularly oval in shape as if it had been formed artificially.

The origin of these kames and sink-holes does not seem to be very well understood, although several theories have been offered to account for them. They were probably formed by some peculiar conformation of the great glacial ice sheet that once covered all New England, by which sub-glacial streams resulting from the melting ice, piled up and arranged the eroded drift material within or beneath the slowly moving mass.

T. J. B.

Autumnal Suggestions.

Already there are symptoms of the approaching autumn. The red maple in the swamps is coloring on one side; the sumacs here and there hang out their scarlet banners. Everywhere the golden rods begin to assert supremacy, and the blue and white asters show their stars in the copse. Long wreaths of blossoming clematis clamber over the bushes—things of exquisite beauty. There is an abandon and reckless grace about the clematis, or Virginia tower, which commends it to the artist. What is there, we wonder, about the leaves which to us suggests a storm-beaten flock of birds? This notion, which we deem original, in a week's time we will find has long ago occurred to some other writer. Truly there is nothing new under the sun.

Among other intimations of autumn is, we are told, the gathering of swallows on the telegraph wires. Do they in this manner communicate a message of departure to comrades further north? There are more things in heaven and earth than we or Horatio wot of. Scollops will soon begin to drift up Cowesett Bay, followed by the white-winged fleet of fishing-boats. Even at noon-tide we hear the rattle of the cicada, that policeman of August, who is perpetually sounding his alarm. It was old Anacreon who said:

> "Happy the cicadas' lives,
> For they all have voiceless wives."

What depth of connubial experience suggested these ungallant lines? Daily we expect to hear the katydid, due in this part of the world about the 8th of August. When we say daily, let no one suppose that we are ignorant of their habit of singing at at night.

We have often wished that Tennyson, who has done so much to embalm the English wild flowers, could know our golden rods and asters. They would well grace an Arthusian idyl. Our own poets are beginning to comprehend them, and we find many American verses aglow with these September blossoms. Other composites, too, are prominent in the landscape, notably the tall purple thoroughworts (*Eupatorium purpureum*) and the iron-weed, or *Vernonia*. The common white thoroughwort is not very showy, but is curious from its perfoliate leaves. We mean by this that the leaves are opposite, and unite around the main stem or axis, so as to leave a sort of cup at the junction. In some plants, like the teasel, this cup is full of water, and isolates the portion of stem above from the approach of unwelcome insects. Flying creatures, on the contrary, like bees, are welcomed by many alluring devices, as by color, nectar, or pollen. Very strange and interesting is this whole matter of the relation of insects to flowers.

The emerald globes of wild grape, in the happy terms of Mrs. Whitman, now begin to "turn to amethyst." If any are yet ignorant of this author's "Still Day in Autumn," they should find and read it. Few word-pictures are truer to nature, or so tinged with local color. Why cannot we have her prose pieces collected and published as well as her poems? Everything she wrote was a finished composition, in which each word was chosen and weighed for its appropriateness. Her name must ever stand high in our Rhode Island Valhalla.

We should not leave this subject without a word of tribute to the cardinal flowers, the summer's crowning glory. By some cool stream, glassy from its depth, and overhung with alders and willows, over which again the larger trees form gothic arches, we will see long ranks of scarlet cardinals stand majestic. This is the place to view and prize them. They are of the woods woodsy; their charm is lost by plucking.

W. W. B.

BUTTONWOODS, Aug. 10, 1886.

Native Forest Trees of Rhode Island.

NUMBER XVIII.

BY L. W. RUSSELL.

THE BIRCHES.—BETULACÆ.

The Black Birch, Betula lenta.

THERE are five species of birch found native in Rhode Island. They are the black birch, *B. lenta*, the yellow, *B. excelsa*, the red, *B. nigra*, the white, *B. alba*, the paper, *B. papyracæ*. Of these, *B. nigra* and *B. papyracæ* are simply local, and the others, except the white birch, can hardly be regarded as common.

The birches, as a genus of trees, must take a second rank in importance in this state. Farther north, they are, relatively, more numerous and important. In the northern parts of New England the birches occupy, as the chief forest tree, extensive tracts. These are frequently found along the flanks of the mountains, belts of wood, almost exclusively of yellow birch. In the British Territory of North America the birches form the chief growth of immense tracts. Approaching the higher latitudes these trees appear gradually more dwarfed, until near the Arctic Circle they dwindle to mere knotty, compact shrubs a foot or two high, the last of woody growths, except the willows.

Some of the birches are among the most graceful and attractive of deciduous trees. The black birch, when freely developed, is in this state, a large, round-headed symmetrical tree, with long slender limbs, and dense, heavy foliage, giving the branches a weeping tendency. But few such trees are seen as they are rarely left single. They are usually found in Rhode Island along the banks of streams and ponds, where the location is cool, and the roots can find abundant moisture. Although nowhere very abundant, they are scattered in considerable numbers, in the locations named.

Upon the edge of a pond on the banks of a stream, the long lithe branches reach towards the water, sometimes dipping into it, forming a beautiful fringe-like border.

The bark is dark iron-gray in color, smooth when the tree is young, rough and in scales upon the outside upon old trunks. The bark of the young shoots has a sweet, aromatic taste, giving it the name of "sweet birch." The leaves are oblong, ovate, and heart-shaped at the base, tapering to a point, finely serrate, smooth, dark green upon the upper surface, paler beneath, veins straight, prominent and hairy upon the under side.

The sterile blossoms upon their jaunty pendent aments, are among the first harbingers of spring. The aments both the fertile and sterile, are formed in July of the season previous to the blossoming. The fertile aments are short, stiff, and erect. The seeds are furnished with a circular wing or samara, by means of which they are freely scattered abroad. It is not uncommon for them to germinate upon a mossy log or in rocky crevices, from whence they grow, throwing out branch-like roots, making the tree, as it develops, a most pitcuresque object.

The wood is fine grained, of a silky lustre, and has a pinkish tinge, from which it is sometimes known as "mahogany" birch. Veneers made from wood formed by the juncture of limbs of this tree are of notable beauty, being much prized in cabinet work. The toughness of the wood makes it valuable for yokes, wooden bowls, and other wood-ware. As fuel it ranks next to the rock maple, while its aromatic odor in burning, makes it very pleasant for an open fire.

For the lover of trees the black birch has many points to commend it. When well developed, it is stately and graceful, the light airiness of its ramification preventing any aspect of stiffness. Its blossoms are the delight of early spring gleaners; its foliage and shade are cheering all summer, while the orange tinting of the leaves in autumn gives them attractiveness to the last of the season. The specimens observed by the writer in this state appear in a healthy, thrifty condition. Near Providence may be found fine specimens on the borders of Mashapaug Pond, in the woods near Silver Spring, and along the banks of the streams in the vicinity. When the fine qualities of this species of birch are better known, it will be prized as a shade and ornamental tree.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XXIV.

8. *Spelerpes bilineata* Baird (*Salamandra bilineatas* Green). The Two-lined Salamander has the teeth small, the tail short and compressed, the flanks presenting thirteen or fourteen grooves, and the inner toes longest. The posterior limbs are, moreover, nearly double the anterior in size. In coloring, yellow predominates, while there are two narrow lines of a deep black shade passing along the back from the orbits, nearly the entire length of the animal. The tail is dark along the sides while below and continuing on to the belly a beautiful unspotted bright yellow shade obtains. Though small and delicate, seldom exceeding three inches in length, the Two-lined Salamander is extremely active, sometimes seen skipping about from under one damp rock to another, or, after rain or in the dusk, emerging from its hiding-place to search for the then inactive gnats, and other small insects. It is interesting to examine the lower side of the animal and observe that the integument is so delicate and transparent that the intestines can be seen passing along as a dark line; quite like that presented by some of the smaller fishes.

The three previous genera are united with the genus *Plethodon* into a family known as the PLETHODONTIDÆ, which is characterized by having the carpus and tarsus unossified, though the vertebræ are as in the genus *Amblystoma*, already described.

9. *Desmognathus fuscas* Rafinesque, (*Salamandra picta* Harlan, *Salamandra quadramaculata* Holbrook). The Painted Salamander is the only one of four North American species of the present genus likely to occur within the boundaries of Rhode Island. The genus *Desmognathus* is the sole representative of the family DESMOGNATHIDÆ,

a family differing from those hitherto treated in several structural peculiarities, though externally indistinguishable from the PLETHODONTIDÆ, with which they have been often confounded.

Desmognathus fuscus is perhaps the most abundant of North American forms. It is over three inches in length; has fourteen costal folds; a long tail equaling the animal in length, and keeled along its upper part. It is brown above with gray and pink shades, the latter being muchmore apparent in the young than in the adult animal. The flanks and belly are marbled, pale shades predominating. The animals enjoy most the shallow and rapid waters of mountain rivulets. In places under every stone an adult animal or its larva is found to take concealment, from which it darts forth on being disturbed, rapidly swimming from rock to rock evidently quite dissatisfied with all.

A most interesting fact in connection with this animal must not be omitted: Professor Baird has noticed that the eggs are wrapped in a long string around the body of the female, who now seeks a damp situation where she remains until all are hatched. This method was for a long time supposed to be only characteristic of the so-called *Alytes*, an anurous Batrachian of Europe.

Before closing with this list I feel it my duty to thank those who have assisted me by giving facts or in making more complete the collection in the museum of Brown University. This now, especially through the courtesy of Professor Baird, contains types of all the forms which I have here mentioned and will be, I trust, of much help to those who may interest themselves in this branch.

Anemones.

WHILE on Chesawannoc or Hog Island, on the twenty-ninth day of September, I climbed down the broken away part of the old wharf, on the east side of the island, for the purpose of observing the Littorina littoria, which were covered with serpula to an extent I had never seen. I do not think a single shell among hundreds were free from these white threads, and the effect both under water and up and down the sides of the wharf, where the Littorina had climbed, was very striking from quantity. While looking to see if the serpula confined its work to the shells, or if the stones were likewise attacked, I saw suddenly blooming beneath me in a hollow of the wharf under water, four sea anemones (*Mytridium marginatum*). They were fixed upon one stone, and varied in size from a dime to a half dollar at their point of attachment. This is my impression as to their size; I had no means of measurement. By some cautious movement of stones near by, I found two or three others, and making signals to friends in a boat at hand, wewere able by use of the boat to make farther search, and soon came upon two more, one much larger than either of the first found.

We moved three small stones to a cove opening out of Bristol Harbor, hoping that the conditions of their new surroundings will be favorable to the increase of this beautiful creature, and left undisturbed in their original home a sufficient number to ensure their continuance in that place.

H. M. K. BROWNELL.

Abnormal Embryos.

IN *Science Observer*, No. 49, Prof. Samuel Garman discusses at some length the occurrence of twins and triplets among the young of the trout and salmon, under culture in hatcheries. In the discussion of the subject some twenty-four examples have been selected, which, drawn by Mr. S. F. Denton, serve to illustrate the principal abnormal peculiarities. The conclusions at which Professor Garman arrives seem logical, and have already attracted considerable attention among those who are interested in embryology.

Professor Garman says: "In the absence of exact data for comparison, in regard to relative abundance, frequency of occurrence, etc., it only remains to offer a few conjectures as to the cause and manner of origin of these monstrosities.

"Were we to adopt for these cases the general conclusion that one spermatozoon only is concerned in the fertilization of each egg, we should be driven to conclude that the embryo has, by more or less complete division, split up to form the monster or the group. And we can not claim that the freak results from fusion without admitting that more than one spermatozoon enters the egg. That the embryo should be split up to such an extent as to produce the various forms noted is quite improbable; but that deformities of the embryo do not occur from fission is undoubtedly true. A hypothesis that would go far toward satisfying the queries is this: An egg might have several micropyles. Many of the eggs bearing deformities are not more than the usual size; plurality of micropyles would meet their cases better than double yolks. It does not seem at all necessary, however, to demand even the malformation of the egg in this manner. Prof. Alex. Agassiz furnishes a clew in his statement that in all his experience in collecting eggs at sea, he has never yet found one of these freaks. If we compare the conditions at sea, and at the hatcheries, we shall find immense differences. At sea the eggs are laid only when fully matured; this is not always the case at the hatchery. To be sure, there are differences in the species at the two localities, but we do not know that any of the various species that have been collected among pelagic fishes have been reported productive of deformities.

In the hatchery, about the time the eggs are ripe, the female is caught, and more or less force is used in taking the eggs. Naturally with those that are fully ripe others not so mature are taken. The finishing touches being put on the outer covering of the egg, the capsule is most likely to prove unfinished if the eggs are taken too soon. The contents may be perfected, though the capsule may not be completed. While the capsule in maturity may resist the intrusion of spermatozoa, compelling entrance at the micropyle, in imperfect condition the same capsule would prove a less effective barrier at its pores or elsewhere. In the imperfection of the capsule we may find at once a means of accounting for the occurrence of the abnormal forms and groups on the egg, and for their frequent apperance at the hatchery. It does not seem unreasonable to conclude that the occurrence of the monsters at the hatcheries is in great measure due to forcible and permature extrusion of the eggs, consequent imperfection of the capsules admitting spermatozoa at various points, possibly before aggregation of the germinal matter at one of the poles has taken place, and resulting in the formation of two or more embryos, which may or may not coalesce."

Sitta Canadensis.

I WOULD like to note through your columns of the capture by myself in Clarendon County, S. C., on the 4th of October, 1886, of a fine male specimen of Sitta Canadensis. I was collecting in a thick swamp, and observed a small bird fluttering about the terminal branches of a large Tripolo, or "Gum" tree, after the manner of a Dendræca. The height of the tree prevented my determining the bird, but the dark colored head seemed unusual, and so I shot and brought down the unknown.

I can find no *direct* quotation of any previous capture of this species for South Carolina.

Audubon says, "Southern limits seldom farther than Maryland, . . . some at the approach of winter venture as far as South Carolina, although never seen in the *maritime districts* of that state."

Unless I am mistaken this will prove the first occurrence of S. Canadensis, certainly in the seaboard in South Carolina.

ELLISON A. SMYTH, JR.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXXIV.

124. LIMNÆA (LIMNOPHYSA) ELODES, SAY.

SHELL tapering, elongated, inelegant; color nearly black; whorls five to six, sometimes perfect at the apex, but generally decollated; aperture about one-half the total length of the shell, sub-oval; lip thin, sometimes with a reddish thickened margin; inner lip covered with a white enamel not closely appressed at the umbilicus. Average length of shell nine-tenths of an inch. It is very variable in form and size, and the largest ones are thinner than the adult small specimens. I have one in my collection an inch and a quarter in length. Found from Hudson's Bay to Pennsylvania and from New England to Oregon.

Like the preceding species, it was first discovered by Mr. Jessup, and described by Say at the same time with it. Many conchologists are of the opinion that this species is identical with L. palustris, Müller, a species which inhabits the whole of Europe and Siberia. This is not my opinion, but if they should be identical, its name should be L. palustris, Müll, as that species was described in 1774.

L. elodes are found all over Rhode Island in slow and rapid streams, stagnant ponds, or wherever there is an abundance of decaying vegetable matter. Very large specimens may be obtained from a pond near the railroad, just this side of the Lonsdale station, while the most perfect ones are found in the Providence and Worcester Canal near Log Bridge, where they are very abundant. They must be collected in June to obtain them in their best condition, for after that month only young ones can be found alive. They attain their full size and age by the first of July, and at this time they cluster together and begin to devour each other's shells. The young mollusks grow rapidly during the summer and fall, and on the approach of winter bury themselves in the mud until the spring opens.

125. Limnæa (Limnophysa) Humilis, Say.

There are eight or ten species of Limnæa found in the United States, which have been referred by different authors to the species, making as many synonyms of it as their opinions concerning it. As most of these are probably distinct species, I will mention only the one variety which is found in Rhode Island, which differs from the typical species.

Limnæa humilis, as Say named it in 1822, is a small, ovate-conic shell, of a light olive, or sea-green color when clean, but as found living, it is almost always covered with a coating of mud. Those found in this vicinity are easily cleaned, but the western specimens, covered with the calcareous mud of that section, require a little dilute chlorhydric or hydrochloric acid to remove the lime. The animal is of a bottle-green color above, dotted with amber spots, and paler beneath. Shell seven-twentieths of an inch in length, with four or five whorls, a little shouldered or flattened above; body whorl two-thirds the size of the shell; aperture a little more than half the length of the shell, rounded; inner lip reflected over a small umbilicus. It is found on the margins of muddy pools, especially in depressions in the earth filled by rain or melting snow in spring, and dry during the summer. On the cross road from Lonsdale to the Diamond Hill Road, about half-way, on the right hand side, under a tree close to the road, is a good locality, where in spring they can be found clinging to stones, and in the summer in the dried mud. If placed in a vessel of clean water they will crawl out of the vessel and will live several days out of the water, but if not replaced by this time they will die, although they live all summer after the pond has dried up, by the side of stones, which condense a little moisture from the atmosphere, even in the dryest weather.

The variety alluded to above, was called Lymnæa umbilicata by Professor Adams, who described it in the *Am. Jour. Sci.*, XXXIX., 374, 1840. Some authors consider it as a distinct species. W. G. Binney in *Land and Fresh Water Shells of North America*, Part II., p. 56, 1865, makes it a synonym of L. caperata, Say. Several years ago I visited a small pool at Pawtucket, called the "Fountain," a depression about twelve feet in diameter, perhaps two or more feet deep, filled with water most of the year. In summer there are times when it is nearly dry, and on one of these occasions I collected a few specimens of what was then a new species to me. A short time afterward I showed them to Prof. E. S. Morse, who pronounced them L. umbilicata, Adams. Two years after, having used most of my specimens for exchanges, I again visited the spot. To my surprise not an umbilicata could be found, but in their place were plenty of the typical L. humilis, of which none were present on my former visit. Unless the umbilicatas were young or undeveloped humilis, in order to explain this curious phenomena, we must call in an act of special creation during the period of two years, and the utter extinction of the former species.

Besides the genus Limnæa, containing over two hundred species, of which five inhabit Rhode Island, as above, there are also eleven other genera in the sub-family Limnæinæ, of which two are represented in the United States. These are Physa, with one hundred or more species, and Aplexa, with twenty-five. We have two species of Physa and one of Aplexa in Rhode Island.

126. Physa Ancillaria, Say.

Syns:

Physa obesa, DeKay, N. Y., Moll., 1843.

"Shell ovate-globose, pale yellowish; whorls four, rapidly attenuated; spire truncate, very little elevated above the general curve of the shell; suture not impressed; aperture rounded in front, seven-eighths the length of the shell. Animal bright lemon color. It inhabits from New England to Louisiana, and is very plenty in some localities, though not abundant in Rhode Island."

It was described by Say in the *Journ. Acad. Nat. Sci.*, V., 124, 1825. It attains a length of over one-half inch by seven-twentieths in breadth. It becomes stout and thick by age, and the reddish rib along the outer lip and the enamel on the columella becomes quite hard and solid.

All the species of Physa and Aplexa are left-handed, *i. e.*, they have the aperture on the left side of the shell and are called sinistral, in distinction from all other fresh water shells inhabiting America which are dextral or right-handed.

127. Physa Heterostropha, Say.

The synonymy of this species is terribly mixed. Our conservative friends who hate to drop a word which no longer has a meaning, but who would still be contented to call spiral shells, land, fresh water, or marine, of any shape or style, by the name of Helix, might, perhaps, agree with Mr. Binney, who in *Fresh Water Shells of North America* adds about a dozen distinct species of shells to the already numerous synonymy of P. heterostropha.

Say first described this shell as *Lymnæa* heterostropha in Nicholson's *Encyclopædia* in 1817, but changed the name to Physa in 1821 in *Jour. Acad. Nat. Sci.*, II., 172. "Shells sinistral, sub-ovate; color yellowish, chestnut, or blackish; whorls four,— the first large, the others very small, — terminating abruptly in an acute apex; aperture oval, three-quarters the length of the shell, within of a pearly lustre, often blackish; lip thickened on the inside and tinged with a dull red."

This species is abundant everywhere in ditches, ponds, and rivers all over North America, north of Mexico. It resembles P. ancillaria but is distinguished from it by the following characteristics: The animal of heterostropha is olivaceous, surface very smooth and silky; ancillaria is bright lemon color. The shell of ancillaria has a shorter spire, a more angular outline, the suture is more closely appressed to the whorls, and the surface of the shell is perfectly smooth. The surface of heterostropha under a glass, is covered with waved, revolving and longitudinal lines. It attains a larger size than ancillaria, and when fully grown, the lip is thickened and the broad, pearly layer of enamel on the columella has a very prominent fold.

(To be continued.)

Hyalinia Wheatleyii, Bland.

In chapter XXIX., page 47, of Random Notes, June, 1886, I published an error in describing species 101 of Rhode Island shells. This chapter was devoted entirely to the new species found by Mr. John H. Thomson, of New Bedford, Mass., which had never been seen by me, or hitherto found in our state.

This species was called Mesodon wheatleyii, Bland, a species found in North Carolina, and described by Mr. Bland, in *Ann. N. Y. Lyc.*, VII., 118, 1860. I supposed this to be the shell meant by Mr. Thomson, and not knowing that Mr. Bland had given two Helices the same specific name, I reprinted Bland's description of Mesodon Wheatleyii. I have since been informed by Mr. Thomson, that this was not the shell discovered in Tiverton, but on the contrary a very different one, namely, Hyalinia Wheatleyii, a small shell also found in Georgia, Tennessee, and North Carolina, and described by Mr. Bland in 1883. I am happy to correct the error at once, and below is the true description of the shell in question:

101. Hyalinia Wheatleyii, Bland.

"Shell umbilicated, depressed, thin, shining, pellucid, brownish horn color, finely striated; spire sub-planulate, suture slightly impressed; whorls little convex, the last rapidly increasing, more convex on the base, scarcely descending at the aperture; umbilicus rather wide, margins of peristomes approximating, joined by a thin callus." Diameter one-fifth of an inch.

It resembles in some respects H. electrina, Binneyana, and arborea.

H. F. Carpenter.

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3	.04	.35	.05	.40	....	....	....	....	.01	.05	.16	3
4	.04	.35	.05	.45	....	....	....	....	.01	.08	.20	4
5	.05	.40	.06	.45	....	....	....	....	.02	.08	.25	5
6	.05	.45	.06	.50	.10	....	....	....	.02	.10	.30	6
7	.06	.50	.07	.60	.10	....	....	....	.02	.12	.35	7
8	.07	.60	.08	.70	.12	....	....	....	.02	.14	.40	8
9	.08	.70	.09	.80	.12	....	....	....	.03	.16	.50	9
10	.09	.80	.11	1.00	.15	1.40	.16	1.50	.03	.18	.70	10
11	.11	1.00	.13	1.20	.16	1.50	.18	1.70	.04	.20	.80	11
12	.12	1.10	.14	1.30	.18	1.60	.20	1.80	.04	.22	1.10	12
13	.14	1.30	.17	1.50	.22	2.00	.25	2.40	.04	.25	1.20	13
14	.16	1.50	.22	2.00	.24	2.20	.27	2.60	.05	.35	1.40	14
15	.18	1.70	.24	2.20	.26	2.50	.30	2.80	.06	.45	1.60	15
16	.22	2.00	.27	2.60	.28	2.70	.34	3.20	.07	.50	1.90	16
17	.23	2.20	.30	2.80	.32	3.00	.36	3.50	.08	.60	2.00	17
18	.26	2.50	.32	3.00	.36	3.40	.42	4.00	.09	.70	....	18
19	.32	3.00	.36	3.50	.40	3.80	.46	4 50	.11	.85	....	19
20	.36	3.50	.40	3.80	.46	4.50	.58	5.50	.14	1.10	....	20
21	.40	3.80	.46	4.50	.50	4.80	.64	6.00	.18	1.20	....	21
22	.50	4.80	.60	5.40	.70	6.50	.80	7.50	.20	1.50	....	22
23	.60	5.30	.72	6.30	.80	7.40	.90	8.50	.22	1.75	....	23
24	.65	6 30	.84	7.50	.95	8.70	1.10	10.00	.24	2.00	....	24
25	.75	7.00	.90	8.40	1.00	9.80	1.20	11.00	.28	2.50	....	25
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FOR SIZES, SEE DIAGRAM, PAGE A.

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Random Notes on Natural History.

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WITH this number, RANDOM NOTES ON NATURAL HISTORY will have completed its third year of issue, and will be discontinued as a regular publication.

Some errors have appeared in its columns which I trust, have been rectified in later issues. On the subjects to which it was devoted I have endeavored that it should be comprehensive and explicit, especially as regards Rhode Island natural history.

From the first, as I anticipated, the expenses of its issue have been in excess of the subscriptions.

Thousands of sample copies have been distributed.

I desire to express my thanks to those whose regular subscriptions have shown their appreciation of my efforts to present articles that should be popular so far as could be consistent with accuracy.

Whilst regretting to leave unfinished the very able articles upon the mollusca and the trees of Rhode Island, there yet seems to me no special need for this publication except to advertise my business.

In view of the numberless claims upon my time by my constantly increasing business, I can now do this to better advantage through other channels.

IF a sufficient number of subscriptions can be obtained it is proposed to print during the coming year the "Shell-bearing Mollusca of Rhode Island," by Mr. H. F. Carpenter, *complete*, in book form. The price will be $2.00 per volume. Subscribers are not expected to pay until the work is ready to be issued.

The Nebular Hypothesis.

BY E. A. PLUM.

IN endeavoring to explain the formation of the solar system, scientists have advanced many theories; one of which, called the nebular hypothesis, bids fair to develop into an established fact. This theory supposes the system to have existed originally in the form of a vast cloud of igneous vapor, "without form and void" and in condensing gradually, to have assumed the form of a greatly flattened spheroid, from which the sun and all the planets were evolved.

Immanuel Kant, one of the greatest of the world's metaphysicians, was probably the first to advance this theory in its undeveloped form; but we must credit that great French scientist, Laplace, with having presented it to the world in its present finished form, and also with having brought about its almost universal popularity. The more we study the writings of Laplace on this subject, the more are we impressed with the grandeur of this theory, and the more are we convinced that it is the true solution of a great problem that has puzzled philosophers of all ages.

In order that we may better understand the nebular hypothesis as it is now believed, let us first briefly consider some of the striking peculiarities of the solar system. First, we find that all the planets revolve around the sun in the same direction. Not only is this true of Mercury, Venus, the Earth, Mars, Jupiter, Saturn, Uranus, and Neptune, but it is also true of a host of other small planets, all of which are moving with mathematical precision around a common centre. Again we learn that each of these bodies has its orbit on nearly the same plane, and all, including the sun, have axial motions in a common direction.

How shall we account for these remarkable facts? If we ask the question, could all this have happened by chance, our reason answers, no; but reason working through the minds of such men as Laplace

Kant, Herschel and others, holds up before us this grand hypothesis, and if we seek our explanation here, these perplexing questions will soon cease to trouble us. Let us then, keeping before us the facts just stated, trace the development of the solar system from "the beginning," using the nebular hypothesis for our guide.

We begin with an almost infinite mass of igneous vapor, whirling in space. As this vast mass cooled and condensed, the outer portion, called the peripheral portion, attained a velocity so great that it entirely overcame the power of gravity. As a consequence, the peripheral portion became detached in the form of a ring — as water is thrown from a revolving grindstone. The ring continued its rotation about the mass till its own oscillations caused it to break into pieces. These pieces gathered themselves in the form of another globe, revolving around the first. In the progress of time, the principal mass, continuing to condense, threw off another ring, which likewise became a globe. This process was repeated from time to time, and the globes thus formed became the planets, and the remaining mass is the sun, which is still cooling and shrinking, and may yet throw off other rings.

Let us now turn to the detached globes. The larger are farthest from the sun, because they were detached when the whole mass was largest. Each began to repeat the process of condensation. Some of the larger ones, from the same cause that brought themselves into existence, threw off rings which eventually became their satellites. Owing to difference in size and velocity some planets threw off more than others. Saturn, for instance, threw off eight rings, one of which still remains unbroken. Our earth detached but one, and then became too solid to repeat the process. Mercury, Venus, and Mars — all smaller than the earth — attained the solid form before the peripheral portions could become separated.

We might cite various other facts that help to prove the truth of the nebular theory. We will mention but one. The spectroscope reveals to us the presence of certain minerals in the sun, which are identical to those found on the earth. Are we not justified in assuming that this fact alone is sufficient proof that the earth and sun were once a part of one great mass?

Some have objected to the nebular hypothesis, because they think it conflicts with the teachings of the Bible. It does nothing of the kind. On the contrary, it agrees perfectly with the bibical account of the creation. What better description of a vast infinite cloud can we find, than is contained in these words "without form and void." The hypothesis only supposes that "God has brought the world into existence by the use of second causes, exactly as He brings a plant into existence." The maples around about us have all undergone "developments." The delta of the Mississippi is undergoing "development." Many islands of the sea owe their existence to the law of development. *All* nature is governed by this law. God has evolved the solar system according to method, exactly as He evolves a tree from the seed. The nebular hypophesis only assumes to take us back to the beginning of natural development. There it leaves us; and, as Alexander Winchell writes: "we dare go no farther; we can go no farther. If science leads us here, she deserts us at this point, and leaves us to lean only on the arm of Omnipotence. Beyond is only God. The beginning of the history of creation does not stretch into inscrutable eternities. We discover the firm rock of support from which all existence hangs. It is the 'Rock of Ages!' We feel comforted and strengthened in knowing that 'in the beginning God created.'"

The Amethyst Locality of Burrillville, R. I.

MINERAL collectors of this state have long been aware that crystals of amethystine quartz of singular clearness and purity have been found at a place known as the "Battey Farm" in the town of Burrillville.

Nearly forty years ago, while an excavation was being made on this place for a barn cellar, many quarts of these crystals were found and given away or preserved in the family.

Some of these were of rare beauty and would have graced any cabinet.

The dirt from this cellar was dumped along the road near by, and for years afterwards, one could pick up beautiful crystals after a shower had washed the dust from them, so as to reveal their purple facets.

The crystals seem to have originated in a bed or seam of vein-granite, in gneiss or mica schist.

The bed rock in which this vein occurs is of a peculiar rusty-brown color, is much broken up by joints, and appears to consist mainly of quartz and a little mica. I do not remember to have seen any rock closely resembling it elsewhere.

It is easily recognizable after being once examined, and I have traced it in a narrow belt from the south end of Herring Pond in a direction about south southwest, to a point just beyond the "Battey place," a distance of nearly three miles.

This rock is well seen where the Providence and Springfield Railroad cuts through it, between Oakland and Harrisville.

Amythysts of good size and shape have been found at this point also, but they were in the drift and were pale in color, somewhat marred and far less clear than those farther south. Lumps of kaolin are also found at this locality, with the crystals, and probably originated from the feldspar in the vein-granite which held the amethysts in its cavities.

I had the exquisite pleasure at one time of emptying a "pocket" of its amethysts in a much decomposed block of this granite. Some of these crystals were clear as glass and highly colored. In many of the larger specimens the color does not seem to be evenly distributed through the crystal but is in layers parallel to the faces of the pyramid, giving rise to "phantoms."

I am not aware that any competent geologist has ever examined this locality carefully, but I think it would present some points of interest to one who could interpret its records, although the ground has been dug over so much that it is difficult to find any amethysts now. T. J. B.

A FINE specimen of American Barn Owl, *Strix pratincola*, was taken at Sand Pond about the third of this month, and on the eighth Mr. Charles H. Lawton obtained, at Newport, a very nice Razor-bill Auk, *Alca torda*.

Native Forest Trees of Rhode Island.

NUMBER XIX.

BY L. W. RUSSELL.

THE YELLOW BIRCH.—*Betula excelsa*.

THE Yellow Birch, *Betula excelsa*, belongs, as a common forest tree, to regions having a colder climate than that of Rhode Island. It is found scattered in considerable numbers, however, in cool, moist localities in this state. It is rarely seen here, either in open ground or as a forest tree, in its full development. Farther north, in New England and in Canada, it is in the woods, a lofty tree, rising sixty or seventy feet without a limb, bearing a few feathery, spreading branches, overtopping, usually, the other trees with which it is mingled. When grown upon open ground from the start, it is a wide spreading tree with a symmetrical orbicular head. In such a situation, the limbs strike out low, are long and lithe, the lower ones taking a graceful curve downwards. At first the limbs form very sharp angles with the main stem and with each other; but their slender habit of growth, combined with their elastic quality in yielding to the winds and coming back to position redeems the tree from any aspect of stiffness. Indeed, it is a tree of notable grace and beauty, deserving a prominent place in arboriculture.

The tree is easily distinguishable from other birches by its bark. The bark upon the limbs, except the smaller spray, and upon the body, unless the tree is old, is yellowish, having a firm, silky luster. The outer portions hang in thin plates, which quiver even in a light breeze. Upon the body of old trees the bark appears in dark, ragged plates, easily broken off.

The leaves of this birch are oval in shape, somewhat narrowed, or slightly heart-shaped at the base, coarsely serrate, and upon short, hairy footstalks. They appear in twos except near the ends of the spray, where they are alternate. In the autumn, they take on fine shades of orange and yellow.

The catkins of the male flowers appear in pretty, yellowish tassels with the opening of the leaves. They are shorter and thicker than those of the black birch. The female

flowers are in short, erect, cone-like catkins, formed of stiff, three-lobed scales containing three winged seeds each, which fall out in autumn.

The wood of this birch is light in color, with a yellowish tinge. As fuel, if well seasoned, it ranks high, next to rock-maple. It is an important market wood from the Northern New England States. Like the wood of the birches generally, its value is lessened for timber by its lack of durability when exposed to alternate moisture and dryness; but for turners' uses, for lasts, and some other purposes it is in constant demand. The tree roots very freely, the bulging from the body of the main branches being prominent and often fantastic. In rocky situations, the roots frequently over-run a boulder or fragment of a broken ledge, clasping it with a Titan's grip.

In regions where the soil and climate is best adapted to this tree, it frequently occupies the ground almost exclusively. This is particularly true in belts upon high hill-sides and the middle portions of mountain slopes, between the belts of maple and ash and those of the red oak and the spruce and fir balsam. A marked example may be seen upon the southern slope of the Monadnock Mountain, N. H., in ascending the path from the Mountain House to the summit.

I think the tree would thrive well in most parts of Rhode Island; at any rate, it deserves the attention of those interested in the trees adapted to local growth.

THE RED BIRCH.—*Betula nigra.*

The Red Birch, *B. nigra*, is reported to be found in one or two localities in the north-western part of this state. It grows, naturally, by streams of water, usually bending over the brink. It is easily identified by its reddish, ragged bark, hanging from the trunk and larger limbs in long, loose flakes, an inch or two wide. It grows quite large with considerable spread. It grows quite abundantly from New Jersey south to Georgia.

THE CANOE BIRCH.—*Betula papyracæ.*

The Canoe Birch, *B. papyracæ*, is merely local in Rhode Island. It is found in considerable numbers upon the Diamond Hill range, near the Massachusetts line, but is rarely met with elsewhere in this state. It is a tree of more northern growth. In Northern New England and Canada it reaches lofty proportions. The bark of larger trees furnished the material for the canoes of the Indians. The trunks are tall, straight, and beautifully white. It has properly been named the "Lady of the Forest." The leaves are quite broad, dark-green, and coarsely serrate. The wood is white, fine grained, and valuable for the turner's use.

THE WHITE BIRCH.—*Betula populifolia.*

The White Birch, or Little Gray Birch, *B. populi folia*, is common in Rhode Island. It will grow in mere sand or gravel, hence, is often associated with poverty. It grows rapidly, and springs readily from the stump when the tree is cut. It takes usually a cylindrical form, tapering sharply at the top. When a half dozen or more sprouts grow from a single stump, their combination forms a wide spreading, symmetrical group of much grace and beauty. The limbs are very numerous, the spray being fine and delicate. The whole tree is very elastic. Covered with ice, as they often are in winter, they form objects of beauty unequaled in art. The leaves are very shining and particularly noticeable for their long pointed tips. Their footstalks are long and slender causing them to quiver in the wind like those of the aspen poplar. The impervious, resinous bark causes the wood to decay when the tree is cut down, unless it is split or deprived of its bark for seasoning. The tree is small in comparison with most others of its genus, but sometimes attains a height of forty feet with a diameter of a foot in the body. Considering the rapid growth of the tree and the fact that it will flourish upon the poorest ground, it is not to be despised.

With respect to their bark, our birches may be distinguished as follows:

Black Birch.— Bark black, peels off with difficulty; scaly on old trunks.

Yellow Birch.— Bark yellow, silky or metallic luster; adhering closely, excepting thin, loose, stringy flakes.

Red Birch.— Bark reddish or copper, very loose, thin plates looking exceedingly ragged.

Canoe Birch.— Bark white, chalky; easily peeled, very resinous.

White or Gray Birch.— Bark grayish-white, containing numerous knots, highly resinous.

The Coast Fox (*Vulpes littoralis*), Baird.

BY E. W. BLAKE, JR.

NEXT to Santa Rosa, Santa Cruz is the largest of the group of islands off the coast of Southern California. It is situated about three hundred miles south of San Francisco, and lies nearly twenty-five miles off shore. The island is about twenty-three miles in length, and in its widest part, perhaps seven miles broad. Santa Cruz is owned by a stock company, and is employed as a sheep ranch, about twenty-five thousand head being kept there.

In general character the island is mountainous, the highest peaks being about twenty-eight hundred feet above the sea. Between two long ridges, extending nearly the entire length of the island, is a narrow but comparatively level valley, where stand the ranch-house and its adjoining sheds—the only buildings on the island. Along the shore are lines of lofty cliffs, with occasional coves or harbors which form the extremities of cañons running up the sides of the mountains.

In winter Santa Cruz is covered with grass and flowers, and there is plenty of water in the cañons, but in summer everything becomes dry and the streams shrink to mere rivulets, or disappear altogether.

A volume might easily be filled with an account of the curious birds and animals upon the island; it is the purpose of the present sketch to describe the habits of one species which is not very generally known—the coast fox, (*Vulpes littoralis*), Baird.

The coast fox is found only upon the Santa Barbara islands, and seems to be entirely distinct from the fox upon the mainland. Upon Santa Cruz it is very common; I have often seen a dozen in a morning's walk. The most noticeable peculiarity of the Coast Fox is its diminutive size. Full-grown individuals measure only about thirty inches in length, including the tail. The coloration is as follows: above, including the upper half of the tail, silver gray; beneath, including the lower half of the tail, reddish fawn color; chin and throat pure white, forehead and a spot at the corner of the mouth, dusky brown; a dark stripe along the tail.

As Santa Cruz is but rarely visited, the foxes have become wonderfully tame. While I was camping out upon the island during the past summer (1886) the foxes soon learned to come around camp about dinner-time, to secure the scraps of meat and fish which were thrown to them by my companions and myself. Our camp was in a cañon, where the stream had washed out a deep channel for itself in winter, and diminishing in summer, had left a convenient place beneath the overhanging banks. The foxes would approach quite boldly to the very edge of these banks — within a few feet of our heads — and carry off whatever we left for them. Nor were their incursions entirely confined to legitimate spoils. Any small article, edible or not, which we left lying about camp in the evening, was apt to disappear in the night,—gloves, stockings, handkerchiefs, sponges, soap, even a pocket of fish-hooks were thus mysteriously spirited away. In general, however, the missing articles were discovered not far from camp, lying where the foxes had dropped them, but some of them we never saw again.

As we saw the foxes every day, we soon learned to distinguish them by their individual peculiarities, and even named several of our most regular visitors. "Dick," "Jenny," "Pete," and "Uncle Joe" came nearly every afternoon; sometimes all four would be eating together. They were especially fond of fish, whether raw or cooked, but did not refuse corned beef, ham, or bacon. They even ate ship's biscuit, and "Dick" was once discovered surreptitiously licking the grease from a sauce-pan, but their favorite delicacy was spoilt blackberry jam. We had brought over a can of this preserve, which upon examination proved unfit for use, so we abandoned it to the foxes. In two days the can was as clean as the most exacting housewife could desire.

On going down to the beach one day, we found it literally covered with hundreds and thousands of little fish, about the size of sardines, some dead, and others still alive. They had evidently been driven into our cove by a school of big bass, and were being cast up by the surf and left on the beach by the receding tide. We picked up about eight hundred and fifty — weighing eleven pounds in all — and took them up to camp. We soon found that we had a good many more than we could eat, and we gave the foxes a treat. They were very much excited, and after devouring as many as they could, proceeded to carry off the rest to their hiding-places among the rocks and bushes. They carried them, of course, in their mouths, sometimes taking five or six at once. That night, we could see in the bright moonlight many dusky forms roaming up and down the beach. It seemed as if all the foxes in the cañon were come to take advantage of the unwonted opportunity.

The foxes did not often quarrel over their food, and even when they did, their only demonstrations of anger were muttered growls or hisses. On the other hand, they were apparently of very affectionate and playful dispositions, chasing each other in sport, and licking one another like kittens. Indeed, their actions and appearance, strange as it may seem, reminded us far oftener of cats than of dogs. They had an eminently feline gait in walking and running — gliding noiselessly and stealthily through the underbrush, or darting with remarkable agility up the precipitous hillsides. Moreover, upon tasting anything disagreeable, like mustard, pepper, or salt, they would nervously shake a forepaw in a manner wonderfully like a cat.

As the climate in summer is very fine, we slept out in the open air, without a tent, and not infrequently were awakened by feeling something clambering over us, or tugging at the blanket, and, as we started up, saw a badly frightened fox scampering away into the darkness.

Although we continually saw them during the day, the foxes are in general of nocturnal, or, at least, of crepuscular habits. During the evenings the cañon resounded with their barkings. This bark or cry is a very peculiar and quite indescribable sound; a fair imitation of it may be produced by turning the handle of a well-filled coffee mill half-way round, sharply and suddenly. The foxes commonly inhabit caves and crevices in the rock, or sheltered retreats in the thick bushes, during such time as they are not abroad, and one of my companions once came upon one fast asleep, under a low bush, during the heat of the day.

Their food seems to be of the most varied and miscellaneous character. The berries of certain plants are undoubtedly their main reliance, and to obtain these the foxes actually do a good deal of climbing, for we more than once discovered them awkwardly perched in the *top* of a good sized bush, eight or ten feet from the ground. Besides berries, they eat crabs, for which they search diligently along the rocks at low tide. While walking among the hills near the sea one morning I discovered the half decayed body of an old ram, which had evidently died a couple of days before. Upon coming nearer I observed the tail of a fox protruding from a huge hole in the side of the carcass, and as I approached the fox came out and ran up to me, apparently impelled by curiosity. He presented a spectacle more easily imagined than described; suffice it to say that his appearance afforded ample evidence of the nature of his repast.

During the spring, the foxes undoubtedly devour the eggs of the smaller birds, when they are fortunate enough to secure them; the gulls, cormorants, and oyster-catchers all nest on the isolated rocks.

More than once we came upon foxes blind in one eye; sometimes both eyes were half closed up. We attributed this misfortune to the long spines of the cactus (Opuntia engelmanni) which abounds upon the island.

The jays (Aphelo coma insularis) Henshaw, do not seem to be much afraid of the foxes, and we often saw amusing quarrels between the two. On one occasion a fox was eating a good sized piece of fish bone on the bank previously referred to, and a jay was perched upon a low branch about a foot above his head. Every time the fox's attention was distracted for a moment from his meal, the jay would dash down from his perch and try to carry off the bone, but always without success, though he occasionally captured a morsel of fish.

Although the foxes were, as I have stated, wonderfully tame we did not succeed in inducing them to take food actually from our hands, though they would often approach within a yard of us when we held out some tempting morsel to them. I have no doubt, however, that they would have soon conquered this natural timidity if we had remained longer at the island, as we took care not to frighten them in any way, valuing too highly our remarkable advantages for observing the habits of these curious animals in their natural state.

Sea Beans.

We would like to ask any of your readers who have been in Florida whether the so-called "sea beans" employed in jewelry grow there? We have brought them from Cuba where they are "at home" and have heard that the common name was given from their being found at sea. They might easily drift to the main coast but have they found the soil and climate suited to their development in Florida?

The yellow bean "Bromis Spinosus" is commonly known in Cuba by its Mexico-Indian name Guacalote; its old aboriginal name was Guanana. The boys of the *Vueltarriba* (*veulta de arriba*), or eastern part of the island use these yellow guacalotes as a kind of money, playing their cards and various games of chance for them, and even passing them as money for some articles. The roundness and smoothness of the smaller yellow ones cause them to be much employed in games similar to our marbles, which they call "horyitos" or little holes, "uñate," and "pila." In one game of "pila" four of these beans are used, three being placed together and the fourth piled above them; in another they strive to overturn a "little house" and call the game from this "casilla" from what they build up of the beans. The small, perfectly rounded ones are known as "teritoes" or "mingoes," while a large, flat, variety is called "catatas." Among the yellow-ones a gray bean is often mixed which is the *Guilandina bonduc* scientifically.

As the boys of the eastern end of the island favor the gaucalote, what is more natural than the hostility shown by the boys of the western end? So in the *Vueltabajo* (*vuelta de abajo*) where the fine cigars come from, the red beans are employed and the yellow ones scorned. The red ones are commonly called mates, and we have been unable to find its scientific name in a very minute work on Cuban natural history. Was the author a Vueltarriban boy?

The boys of Bayame name the last bean left in playing their games the gaubino.

H. M. K. B.

"I NEVER argy agin a success," said Artemus Ward. "When I see a rattlesnaix's hed sticking out of a hole, I bear off to the left, and says I to myself, that hole belongs to that snaix."

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXXV.

128. APLEXA HYPNORUM, LINNÉ.

Syns.:

Physa elongata, Say.
Physa glabra, DeKay.
Physa elongatina, Lewis.
Physa turrita, Sowb.
Bulinus hypnorum, W. G. Binney.

This species was described by Linnæus in 1758, as Bulla hypnorum, and afterwards described in English works under ten different synonymous names, none of which are included in the above list. It seems to be one of few species which inhabit the circumpolar and temperate regions of Europe, Asia, and America. Shell very thin, fragile, transparent, sinistral, oblong; color, pale yellow; whorls, six or seven; spire tapering, acute; suture impressed; aperture obliquely ovate, narrow, one-half the length of the shell; columella callously edged. Length seven-tenths of an inch, breadth three-tenths. This is the description of the European specimens, and will apply to those of British America and the Western United States. In 1821 Say described a shell which he called Physa èlongata, which has been referred by most authors to hypnorum. The specimens vary a great deal from different localities and those from Rhode Island compared with the typical species might easily be taken for different species, we find them here much smaller in size, rarely over three-tenths of an inch in length, very slender, brittle, and thin, with no callously ridged columella, and with one to two whorls more than the larger, more solid English specimens. I have them labelled Physa elongata in my cabinet, side by side with another tray of hypnorum from England, and to look at them together, nine out of every ten persons would say they were different species.

In *Am. Jour. Conch.*, II., 7, 1866, is a list of new localities for Physa, in which is the following remark: "Physa integra, Hald, Rhode Island. (Coll. Tryon)." I would like to ask for further information. I know of no such species in the state, and would like to know on whose authority this remark was based, also the precise locality etc., etc.

Sub-family Planorbinæ.

The shells of this sub-family are all discoidal, spiral, and the apex sunk in the nucleus of the coil; whorls three to seven, smooth or striate, sometimes keeled.

The animals have the orifices of their generative, excretory and respiratory organs on the left side like those of Physa, but their shells are dextral like all other gasteropods, with few exceptions. This sub-family contains two genera, Planorbis and Segmentina, both of which are represented in Rhode Island.

GENUS PLANORBIS GUETTARD.

All the shells of this genus existing in the Old World, belong to one type and number only about thirty species, eleven of which inhabit Great Britain and the remainder scattered through Europe, Africa, India, Ceylon, and Australia. On the other hand we have over seventy species in America, belonging to five or six distinct types or sub-genera. They are all very sluggish in their habits and prefer stagnant pools.

129. PLANORBIS LENTUS, SAY.

Mr. Say discovered a shell in a canal near New Orleans and afterwards other specimens of the same in Mexico, which he described in 1834 in the *American Conchology*, published at New Harmony, Ind., under the name of Planorbis lentus; previous to this, in 1817, he described a shell which he called Planorbis trivolvis. Authorities quote both species from all parts of the Uuited States, but the subject is somewhat mixed. I have never found or heard of P. trivolvis being found in Rhode Island, but have plenty of P. lentus, if one can tell anything by descriptions and plates. Professor Adams in speaking of this shell refers it to P. trivolvis in the *Shells of Vermont*, and in his list of "Middlebury shells" to P. corpulentus. Gould says: "This shell has hitherto borne the name of trivolvis in New England, but it is not the trivolvis of Say, and is either his lentus or a new species." Gould's figure and description of lentus is referred by Hadleman to P. fallox. W. G. Binney says: "It is not the lentus of Say," and refers it to trivolvis. Perhaps trivolvis and lentus are the same species, modified by localiy, etc. But I am of the opinion that our Rhode Island lentus is a distinct species from the trivolvis of the Middle and Western States.

It is a discoidal shell, concave on both sides, the spire sunken in on the upper side showing three volutions, just like the umbilicus on the under sides of many helices; lower surface cup-shaped, formed of four whorls; aperture large; lip sharp, thickened within by a dark reddish-brown callous; color of the shell brownish or chestnut; diameter seven-tenths of an inch.

My specimens were found in a meadow overflowed with water near Ashton, on the Cumberland Hill road. What seems strange in the instincts of these animals is, that although the place overflowed is quite large, and after searching in vain, by wading into it in several places, and in looking carefully around its entire curcumference, not a shell could be found; they were found abundantly in one spot, exactly under the shadow of a willow tree, standing at the edge of the pond near the road. Other species of shells were found in all parts of the pond, but of this species none, excepting those under the tree.

130. PLANORBIS (HELISOMA) BICARINATUS, SAY.

Syns.:

Helix angulata, Rackett, Wood, Hanley.
Helix bicarinatus, Eaton.
Planorbis engonatus, Conrad, Lister.

The sub-generic name, Helisoma, was given by Swainson in 1840, to those species of Planorbis which are ventricose in form, with but few whorls, and in which the spire is sunken below the body whorl. This subgenus includes eight species of North American Planorbis, only one of which, bicarinatus, inhabits Rhode Island.

The shell is orbicular, deeply excavated and carinated on both sides, color brownish yellow; spire sunken, forming a cavity nearly as deep as that on the under side; whorls three and a half, visible on both sides; aperture large, embracing a large part of the body whorl and vaulted above; lip white and expanded, interior brownish red; diameter of shell one-half inch. It ranges from New England to Kansas, and from British America to Georgia. It is not very common in Rhode Island, but is found in still water, on the margins of large ponds and not in muddy pools. It is quite abundant in the Providence and Worcester

Canal near the Mineral Spring Pike and in Cunliff's Pond.

131. Planorbis (Planorbella) Campanulatus, Say.

Syns.:

Planorbis bellus Lea.
" bicarinatus, Sowb.
Planorbella campanulata, Chemn.
Helix angulata, Shep.

This and one other species, found in Mexico, constitute the sub-genus, Planorbella of Haldeman, characterized thus: "whorls few, aperture campanulate or bell shaped, prominent."

This species is widely spread from Nova Scotia and New England through the northern tier of states to Minnesota. It is not abundant anywhere except in certain local spots. It was first found by Mr. Augustus Jessup in Cayuga Lake, New York, and described by Say in 1821 in *Journ. Acad. Nat. Sci. Phila.*, II., 164. Shell discoidal, sinistral, brownish green in color, lighter at the sides; the right side exhibits a little more than two volutions, which are elevated to an obtuse ridge, and forms an umbilicus which nearly perforates the shell; the left side shows four volutions, and forms a shallow cup; the whorls are very regular and symmetrical up to the last portion of the body whorl, where it is suddenly distorted and enlarged, forming a bell-shaped throat; the aperture is dilated and angulated on the left side; lip brown within; diameter one-half inch. Dead shells are found plentifully on the banks of the Blackstone River, at Pawtucket in the spring, among the *débris* left by freshets, but Valley Falls Pond is the place where they are found alive, also in Sneach Pond in Cumberland.

Hazel-Copses.

We often think that the loveliest things in the woods are not the flowers, but the green buds, the leaves, and fruits. At present our attention is called to this fact by the grace and elegance of the hazel-copses. On each branch hangs a group of nuts, and each nut is inclosed in a superb casket with crimped and scalloped edges. The vessel itself fits closely to the nut, and its lower or body part often assumes shades of delicate brown, otherwise the whole object is of tender green. The rough leaves of hazel, too, with their doubly serrated edges, are things of beauty. Already the shrub bears the young tassels of next year. So in nature, do youth and age walk hand in hand.

In these days, when all sorts of objects are glorified by the art-lover, has the hazel ever received its need of attention? In Rhode Island we have another species, not so common, the so-called beaked hazel. It is not so handsome as its relative. Do squirrels or boys hereabouts eat these nuts? All of a sudden they disappear. That filberts are good, every dessert service shows. Often an animal is the first to indicate the the value of a vegetable. Rarely does an insect mistake its food plant. Cattle have, ere now, discriminated differences which the botanist only half surmised. So are we linked with chains invisible, but binding, to the lower forms of creation. W. W. B.

The Dispersion of Seeds.

Geographical botany or the distribution of plants over the earth has deservedly received the attention of the profoundest students. Humboldt, Decaudolle, Grisdad, Hooker, and our own beloved Gray, have all taken up the subject at one time or another. It presents many problems to exercise the most philosophical minds. Plants are so affected by environment and conditions that one must know something of kindred sciences, such as geology and physical geography, and even meteorology, to approach it *understandingly*. But among the most fascinating chapters of modern botany are those which treat of vegetable dispersion. Let the reader to substantiate our words, consult the admirable lecture on Sequoia (the giant tree of California), in Gray's "Darwinians," or the wonderful *Introduction to the Flora of Australia*, by Sir Joseph Hooker, or the same author's preparatory remarks in the *Flora of New Zealand*.

It is a smaller and lighter side of the subject to which we now desire to direct attention, viz., to some of the ways in which seeds or fruits are disseminated. In popular language the two are often confused, and no wonder, as they frequently resemble each other. Suffice it here to say that a seed proper is a definite and restricted body having its own coatings; to which, however, those of the fruit may adhere. By a fruit, in science, we mean the ripened pistil, with all adhering portions and the contained seed. Nature's object is to disperse this seed, not always widely, but at a distance more or less remote from the parent. Thus the future offsprings have a show in pastures new and under more favorable conditions, as the parents may have exhausted the original soil. To bring about this result many devices are resorted to. One of the commonest is a tuft of hairs, simple or plumose, such as we know in the thistle and dandelion, where it is attached to the fruit, or in the milkweeds and willow-herbs (epilboium), where the seed itself is so endowed, we rarely, if ever, find both pod and seed so furnished. In other words, there is no waste of devices. If one gathers the floating thistle-down, in many cases he will perceive that the parachute has dropped its precious burden near home. How beautiful are these featherly baloons, wafted about by the slightest breeze.

Among trees it is more common to find winged seeds or fruits, as the case may be. Thus, the maples, elms, and ashes, all have such. In the lime or linden the whole cluster of berries is borne off attached to the bract. Notice as these fall from the tree the rotatory movement, giving the body a divergent propulsion. In the ash the wing twists on its axis, and forms a sort of propeller fluke. Hooks and grapnels are favorite mechanical contrivances. The heads of burdock are covered with retrorse hooks. Every one knows how the little fruits of the bed straw (Galium) attach themselves to garments. So do the troublesome beggars ticks and the jointed pods of desmodium, and many fruits of the forget-me-not family. The armature of some foreign fruit is very formidable; he must pity the unwilling agents of dispersion.

Many seeds are expelled from the fruits by curious mechanical contrivances. The witch-hazel shoots off its seeds as from a pistol. Some of the violets and the related ionidium throw them many feet. The squirting cucumber ejects them in a jet of liquid. The wild geranium throws them at maturity by the tension of a spring. The blossoms turn the pod inside out with a jerk. There are seeds that at a particular time, say when they reach moist soil, release from their surface long flexible hairs which bind them to the earth. The seed of mistletoe is viscid, and causes it to adhere to the surface of trees, its future medium of growth.

We must not forget that many fruits are covered with a luscious pulp, at maturity colored, and attractive to birds and other animals. The continued seed is either rejected or undigested. Darwin tells us that wading birds carry many seeds attached to the mud on their feet. So the migrations of animals and the operations of man tend to scatter plants over the earth. They pass on attached to fleece or feathers, to cotton buds, to wool, and other fabrics. We cannot wholly dissociate ourselves from these humble attendants. They follow us everywhere, for good or for evil. Sometimes they spring up as useful plants or showy flowers. Quite as often they disturb us as pestilent weeds.

In an article of this length it is quite impossible to present more than the barest outline of this subject. We have long been amassing notes from personal observation and from careful reading. The more we study, the more astonished and delighted do we become. There is absolutely no end to the beautiful adaption exhibited. It is but tantalizing to offer the public this mere luncheon when the feast, free to all, is so bounteous. W. W. B.

A REMARKABLY fine specimen of ruddy duck — a male — in *perfect* plumage, with the neck and upper parts brownish red, lower parts silvery, shaded with dusky, sides of the head white, crown black, bill a very striking blue, has just come into my hands. It was taken in this locality and is regarded as a rare bird, being the first that has come under my manipulation in this condition of plumage. THOS. W. FRAINE.

AN oriole built a nest in a small apple tree near my house. I watched the building, and soon discovered there one egg. A week later there was only one egg and no female appeared for several days. I then took the egg. The male still lingered about the tree, and three weeks later a female came and laid a set of eggs, and reared her brood late in the summer. I surmise a cat had killed the first female. I watched the constancy of the male through his month of loneliness with much interest.

JOHN N. CLARK.

It will be interesting to entomologists to note that a fine specimen of Heliconia charitonia was captured near Beaufort, S. C., in March, 1886. As this fly has been taken in Florida, it is not remarkable, but still worthy of note, to record this more northern range. Our Carolina swamps are so little searched by naturalists, and this more from their impenetrability than from other cause, that it is not surprising what results will repay the ardent collector who forces his way through the knife-like leaves of the bamboo thickets with which the swamps are overgrown, as is evinced by Mr. Wayne's rediscovery of Swainson's Warbler. Kirtland's and Bachman's Warblers are possibilities that go far to smooth a rough path. Even the moccasin's deadly sting loses its venom at the thought of such captures, and swamp fever cannot be mentioned in the same breath.

I would also like to record the observance by myself at three separate times this past August, of Myrarchus dominicensis on Sullivan's Island in Charleston Harbor. A year or so ago Mr. Wayne and Mr. Brewster took the nest and eggs and parent bird of this species on the same island. B. A. S.

On examination of the sixteenth annual report of the Entomological Society of Ontario, I find a tabulated description of fifty-two species of butterflies belonging to the province of Quebec, also a very interesting article on the catocalæ or underwing moths, describing with care thirty-two species. Most of these butterflies and moths are to be found in the United States, particularly our Northern and New England sections. Any entomologist who has not ready access to many works on insects, should try to secure a copy of this work, for beside the articles mentioned, the sixty pages are replete with articles most instructive and interesting.

A Quick Method of Cleaning Greasy Coleoptera, Etc.—Lately I have employed the following method with the happiest results. It may be old and well known, but I do not remember to have seen it suggested. Dip the insect one half to one minute in spirits of ammonia (Liquor ammonæ), wash in water (the hotter the better), and the thing is done. Offensive beetles like *Trox Silpha*, etc., can be cleaned and purified instantly. How far the ammonia may be employed in cleaning Lepidotera and other insects, I do not know, but it renewed the beauty of two very greasy specimens of *Cossus Centerensis*.

This liquid also dissolves the verdigris that forms on the pins passed through insects; but the insect must remain longer in the ammonia and be more carefully washed.— *Canadian Entomologist*, *June*, *1886*.

"How to Restore the Rubber Rings of Cans.—The rubber rings by the use of which fruit cans are made air-tight, after being used, become hard and unyielding, so much that fruit seldom keeps as well when they are used the second time. Though new ones cost but little, it is not always convenient to get them. Every one should know that the elasticity of the old ones can be restored, and that they can be made as good as new by soaking them a half-hour in a mixture of ammonia and water—two-thirds ammonia and one-third water. Try it."

If a sufficient number of subscriptions can be obtained it is proposed to print during the coming year the "Shell bearing Mollusca of Rhode Island," by Mr. H. F. Carpenter, *complete*, in book form. The price will be $2.00 per volume. Subscribers are not expected to pay until the work is ready to be issued.

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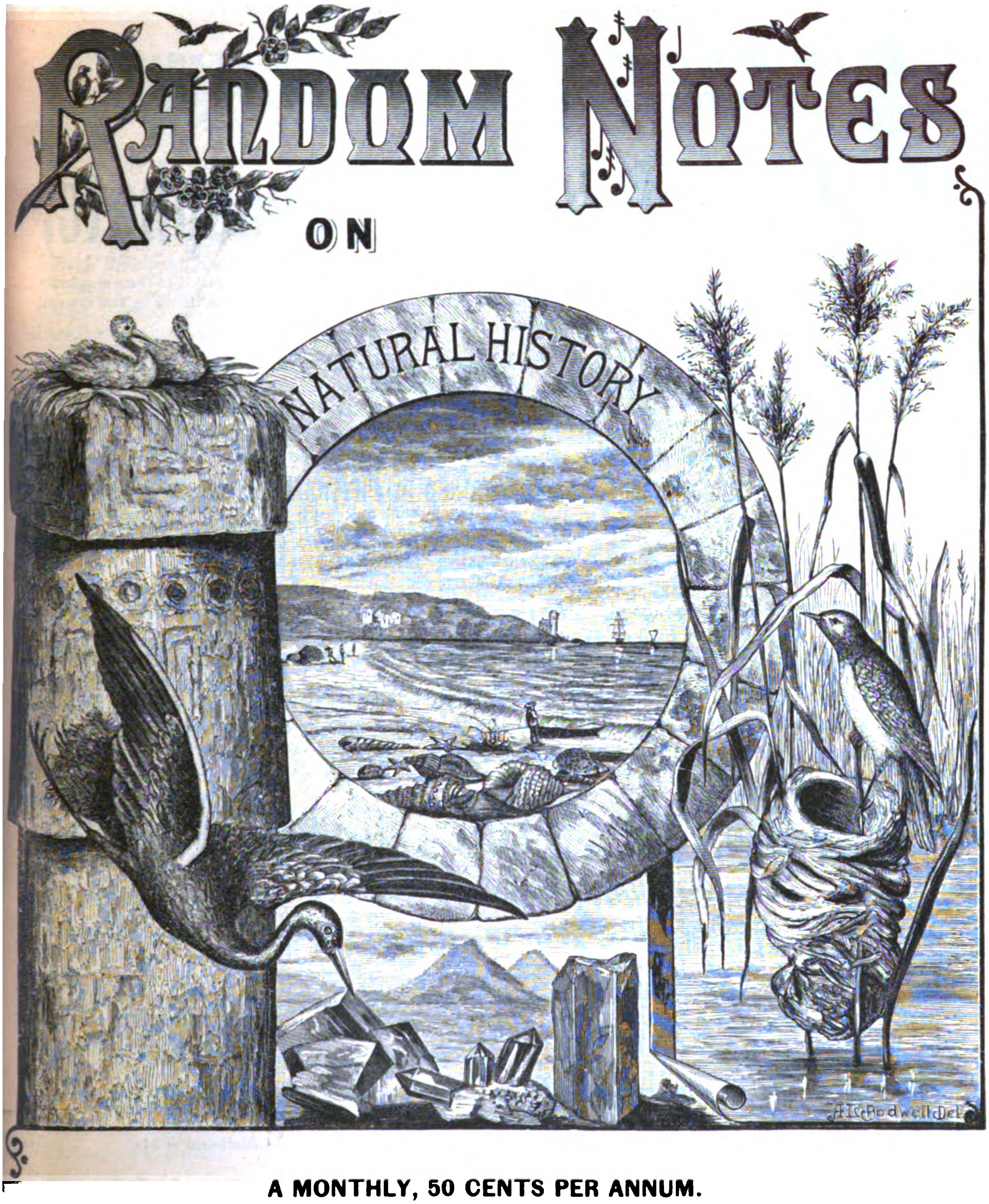
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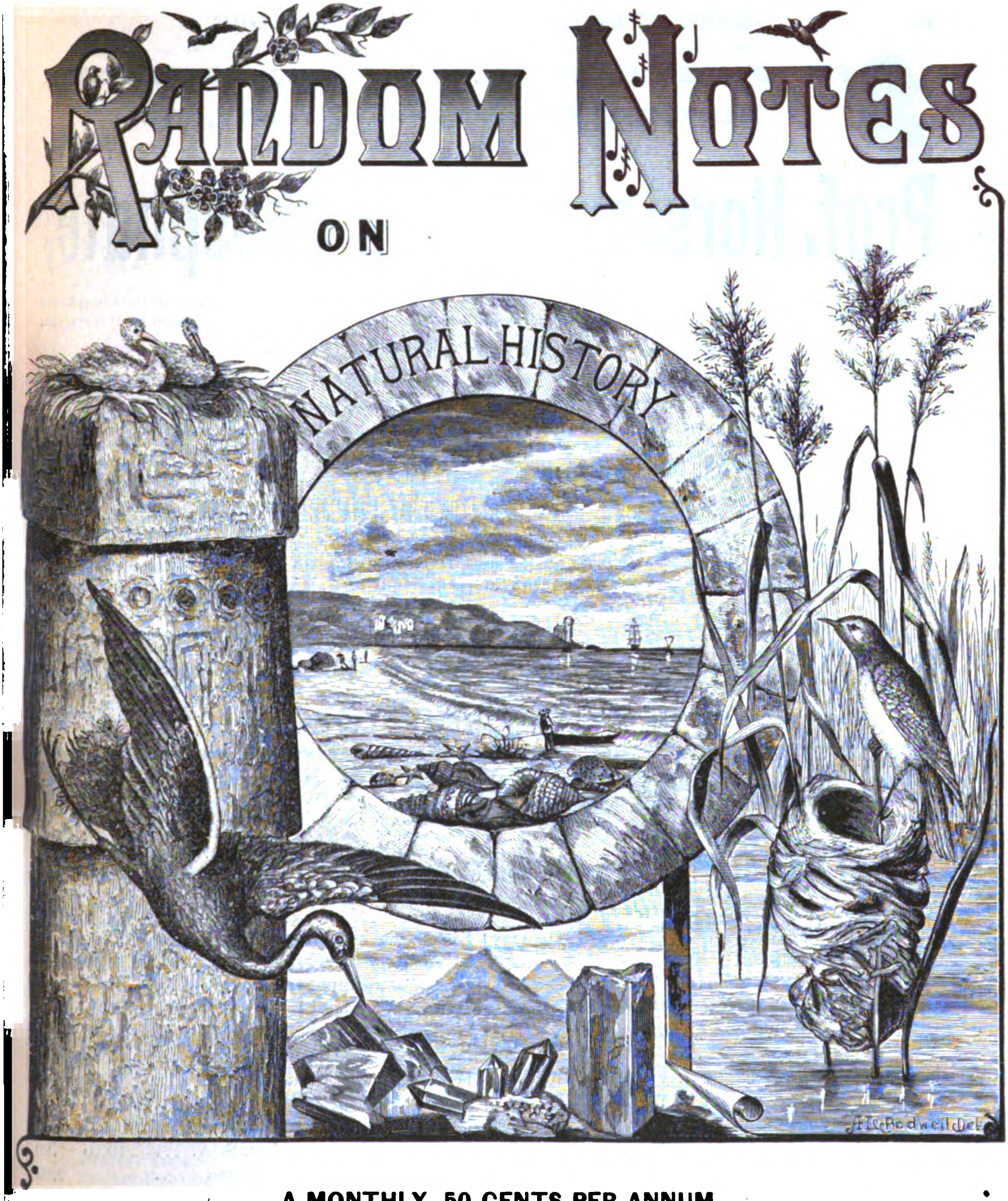
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NEW SHELLS.

Voluta Pacifica Soland, New Zealand	$0.50 to $2.50
Cassis Pyrum Lam., New Holland	.25 to 1.00
Olivella biplicata Sowb., Cal	.05 to .10
Nerita scabricostatus	.10 to .25
Nerita Albicella Lin	.10 to .15
Nerita peleronta Lin., W. I.	.05 to .10
Trochus Cunninghamii Gray, New Zealand	.25 to .75
Purpura (Trochia) succineta Mart. New Zealand	.15 to .25
Ancillaria Australis Sowb., New Zealand	.15 to .25
Parmophorus Australis Lam., New Zealand	.15 to .25
Turbo Cookii Chem., New Zealand	.40 to 1.25
Auricula Midæ Lam., New Guinea	.40 to .75
Struthiolaria nodulosa Lam., New Zealand	$0.50 to $1.25
Conus betulinus Lin., Ceylon	.35 to 1.00
Helix nemoralis Lin., France	3 for .15
Helix Pisana Mull., France	3 for .15
Helix Hortensis Mull., France	3 for .15
Helix Virgata Mont., France	3 for .15
Helix Cooperii, Utah	.10
Helix cicatricosa Gme., China	.50
Bulimus fulguratus Jay, S. A.	.10 to .20
Ranella pulchra Gray, Japan	2.00
Guildfordia triumphans Gray, Japan	2.00
Ficula Dussumieri Val., China	.30 to .50
Turbo (Prisogaster) niger Gray, Peru	.15 to .25
Tectarius papillosus Lamk., E. I.	.25
Tapes turgida Lamk.	.25

EXCHANGE.

We herewith give a list of the commoner skins and eggs we desire. Also a list of what we have for exchange. We want fine skins only and nicely prepared, and positively identified eggs. Those having any we want will oblige us by sending lists of the same, with the prices at which they are willing to exchange them, taking ours at list prices; and also state what they want in exchange. We shall be pleased to hear from those desiring to exchange who can get what we want but haven't it at present.

SKINS WANTED.

1. Wood Thrush.
3. Gray-cheeked Thrush.
4a. Olive-backed Thrush.
10. Sage Thrasher.
61. Bewick's Wren.
63. House Wren.
67. Long-billed Marsh Wren.
67a. Tule Wren.
71. American Titlark.
81. Golden-winged Warbler.
86. Orange-crowned Warbler.
87. Tennessee Warbler.
90. Cape May Warbler.
93. Summer Yellow Bird.
120. Mourning Warbler.
138. Philadelphia Vireo.
150. Northern Wax-wing.
151. Cedar Wax-wing.
152. Purple Martin.
154. Barn Swallow.
155. White-bellied Swallow.
157. Bank Swallow.
181. American Goldfinch. ♂
186. Snow Bunting.
188. Smith's Longspur.
191. Baird's Bunting.
198. Yellow-winged Sparrow.
201a. Nelson's Sharp-tailed Finch.
244. Rose-breasted Grosbeak.
248. Indigo Bunting.
251. Painted Bunting.
271. Baltimore Oriole.
285. Maximilian's Nutcracker; Piñon Jay.
287. Yellow-billed Magpie.
318. Olive-sided Flycatcher.
322. Yellow-bellied Flycatcher.
335. Ruby-throated Humming-bird.
354. Whip-poor-will.
359. Ivory-billed Woodpecker.
366. White-headed Woodpecker.
375. Red-headed Woodpecker.
376. Lewis's Woodpecker.
385. Road-runner; Chaparral Cock.
387. Yellow-billed Cuckoo.
395. American Long-eared Owl.
396. Short-eared Owl.
402a. Florida Screech Owl.
405. Great Horned Owl.
405b. Arctic Horned Owl.
406. Snowy Owl.
414. American Peregrine Falcon; Duck Hawk.
420. Sparrow Hawk.
426. Swallow-tailed Kite.
433. American Goshawk, adult.
443. Broad-winged Hawk, adult.
459. Passenger Pigeon.
479. Sage Cock.
480. Bob-white; American Quail.
481. Mountain Quail.
489. American Egret.
490. Snowy Heron.
491. Reddish Egret; Peale's Egret.
496. White-crowned Night Heron.
515. American Golden Plover.
523. Mountain Plover.
525. American Woodcock.
528. Stilt Sandpiper.
534. Pectoral Sandpiper.
536. Bonaparte's Sandpiper.
537. Baird's Sandpiper.
541a. Western Sandpiper.
549. Yellow-legs.
550. Solitary Sandpiper.
555. Bartram's Sandpiper; Field Plover.
556. Buff-breasted Sandpiper.
560. Eskimo Curlew.
565. Wilson's Phalarope.
572. Virginian Rail.
574. Sora Rail. Spring.
575. Little Yellow Rail.
582. Whooping Crane.
588. Whistling Swan.
589. Trumpeter Swan.
591. Snow Goose.
591a. Lesser Snow Goose.
594a. Hutchin's Goose.
613. Wood Duck; Summer Duck.
634. Ruddy Duck. Spring.
638. Hooded Sheldrake.
643a. Florida Cormorant.
675. Bonaparte's Gull. Adult.
683. Cabot's Tern.
693. Black Tern.
722. Wilson's Petrel.
723. Leach's Petrel.
729. Western Grebe.
731. American Red-necked Grebe. Spring.
732. Horned Grebe. Spring.
736. Loon. Spring.
740. Red-Throated Diver. Spring.

EGGS WANTED.

2. Wilson's Thrush.
68. Short-billed Marsh Wren.
*99. Chestnut-sided Warbler.
135. Red-eyed Vireo.
139. Warbling Vireo.
140. Yellow-throated Vireo.
158. Rough-winged Swallow.
161. Scarlet Tanager.
248. Indigo Bunting.
257. Bobolink.
280. American Raven.
291. Florida Jay.
318. Olive-sided Flycatcher.
335. Ruby-throated Humming-bird.
351. Chimney Swift.
353. Chuck-will's-widow.
354. Whip-poor-will.
357. Nighthawk.
360. Hairy Woodpecker.
371. Pileated Woodpecker; Log-cock.
378. Yellow-shafted Flicker.
397. Barred Owl.
405. Great Horned Owl.
425. American Osprey Fish Hawk.
426. Swallow-tailed Kite.
432. Sharp-shinned Hawk.
443. Broad-winged Hawk.
449. Golden Eagle.
451. Bald Eagle: Gray Eagle.
459. Passenger Pigeon.
480. Bob-white; American Quail.
495. Black-crowned Night Heron.
497. American Bittern.
498. Least Bittern.
500. Wood Ibis.
516. Killdeer.
520. Piping Plover.
523. Mountain Plover.
525. American Woodcock.
558. Long-billed Curlew.
566. American Avocet.
567. Black-necked Stilt.
569. Red-breasted Rail.
582. Whooping Crane.
583. Sandhill Crane.
613. Wood Duck; Summer Duck.
638. Hooded Sheldrake.
643a. Florida Cormorant.
681. Royal Tern.

---

* And fine sets of almost any of the other warblers.

SKINS FOR EXCHANGE.

5. Dwarf Thrush.
36. Tufted Titmouse.
54. Pigmy Nuthatch.
56. Cactus Wren.
75. Prothonotary Warbler.
77. Worm-eating Warbler.
79. Blue-winged Yellow Warbler.
103. Yellow-throated Warbler.
119. Kentucky Warbler.
124. Hooded Warbler.
166. Pine Grosbeak.
173. White-winged Crossbill.
192. Ipswich Sparrow.
199. Henslow's Sparrow.
200. Leconte's Sparrow.
216. White-winged Snowbird.
218. Oregon Snowbird.
219. Pink-sided Snowbird.
220. Gray-headed Snowbird.
226*a*. Oak-woods Sparrow.
239. Green-tailed Towhee.
253. Black-faced Seedeater.
261*a*. Red-and-black-shouldered Blackbird.
262. Red-and-white-shouldered Blackbird.
269. Hooded Oriole.
272. Bullock's Oriole.
295. Arizona Jay.
306. Western Kingbird.
307. Cassin's Kingbird.
336. Black-chinned Hummingbird.
339. Broad-tailed Hummingbird.
343. Calliope Hummingbird.
362. Red-cockaded Woodpecker.
365. Strickland's Woodpecker.
367. Black-backed Three-toed Woodpecker.
369*a*. Red-naped Woodpecker.
369*b*. Red-breasted Woodpecker.
374. Gila Woodpecker.
402. Little Screech Owl.
436. Red-tailed Hawk.
442. Swainson's Hawk.
456. Band-tailed Pigeon.
482. Californian Quail.
522. Wilson's Plover.
529. Knot; Robin Snipe.
530. Purple Sandpiper.
542. Sanderling.
552. Willet.
564. Northern Phalarope.
592. Ross's Snow Goose.
595. Brant.
596. Black Brant.
610. Cinnamon Teal.
619. Barrow's Golden-eye.
656. Black Skimmer.
663. Great Black-backed Gull.
666*a*. American Herring Gull.
679. Gull-billed Tern.
681. Royal Tern.
685. Forster's Tern.
686. Common Tern.
687. Arctic Tern.
690. Least Tern.
691. Sooty Tern.
709. Greater Shearwater.
732. Horned Grebe. Young.
752. Sea Dove; Dovekie.
764*a*. Brunnich's Guillemot.

EGGS FOR EXCHANGE.

56. Cactus Wren.
63*a*. Western House Wren.
145. Bell's Vireo.
149. Loggerhead Shrike.
149*a*. White-rumped Shrike.
182. Green-backed Goldfinch.
201. Sharp-tailed Finch.
202. Sea-side Finch.
204. Lark Finch.
204*a*. Western Lark Finch.
217. Black Snowbird.
240*b*. Californian Brown Towhee.
260. Yellow-headed Blackbird.
261*a*. Red-and-black-shouldered Blackbird.
270. Orchard Oriole.
272. Bullock's Oriole.
274. Brewer's Blackbird.
277. Boat-tailed Grackle.
301. Scissor-tailed Flycatcher.
317. Black Pewee.
378*b*. Red-shafted Flicker.
411. Whitney's Pigmy Owl.
465. Ground Dove.
477. Prairie Hen.
487. Great Blue Heron.
492. Louisiana Heron.
507. American Oystercatcher.
522. Wilson's Plover.
552. Willet.
581. The Limpkin.
585. American Flamingo.
601. Mallard.
627*a*. American Eider.
640. American White Pelican.
642. Common Cormorant.
649. American Anhinga; Snake Bird.
650. Gannet.
656. Black Skimmer.
663. Great Black-backed Gull.
666*a*. American Herring Gull.
673. Laughing Gull.
679. Gull-billed Tern.
680. Caspian Tern.
685. Forster's Tern.
723. Leach's Petrel.
742. Razor-billed Auk.
743. Common Puffin.
760. Black Guillemot.
763*a*. California Guillemot.

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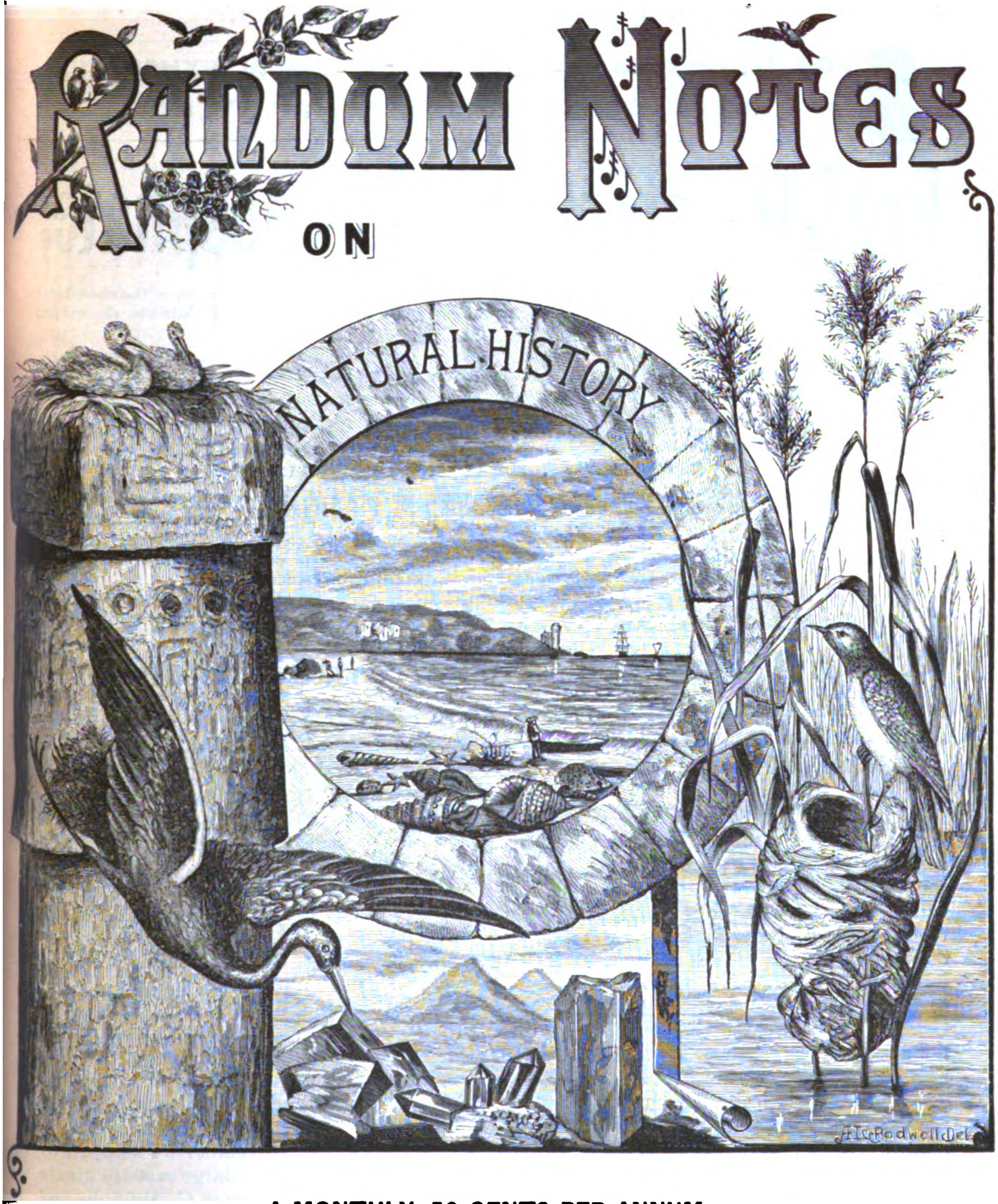
VOL. II. NO. III.

RANDOM NOTES ON NATURAL HISTORY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BEWARE OF IMITATIONS.

The New Orleans Exhibition.

PROBABLY all of our readers are aware that the United States Congress appropriated $1,000,000 for the purpose of assisting the State of Louisiana to inaugurate and carry on for six months a grand exposition of the manufactures and natural products of the world, to be called the "World's Industrial and Cotton Centennial Exposition," to be opened in December, 1884, at New Orleans. A most fitting celebration in honor of the increased production of cotton in America during the past decade. In 1784 America exported six bags of cotton, and now we find reported a supply of 3,405,000,000, or 85 per cent. of the production of the world.

We have been for the past two months in constant receipt of varying reports regarding the financial condition and success of the fair, the insufficient accommodations, bad management in some departments, bad weather, deep mud, etc. Many of the exhibitors were late in applying for space, and it seems also possible that the managers of the affair did not at first realize the magnitude of their undertaking; but in spite of all drawbacks a most notable exposition is well under way.

Having accepted the office of Commissioner of Rhode Island, Mr. Arnold B. Chace proceeded promptly to develop the resources of our little state, and her exhibit was in a very complete condition on the opening day. About the middle of July Mr. Chace delegated to our firm the arrangement of the Zoology and Mineralogy of the state. The time was short and much of the material scattered abroad and to be collected. With considerable misgivings we set about it, and on the fifteenth of November we shipped to New Orleans twenty-five large cases of goods in charge of Mr. Hermon C. Bumpus, of Brown University, and to his energy we are indebted for the fact that our exhibit is reported as having been the first one that was absolutely in order in the Government and State Building.

(Continued on page xi.)

(Continued from page x.)

These goods when placed in position occupied fifty-five feet by four of glass counter cases, and twelve by six of upright black walnut museum cases. All the stuffed mammals, with one exception, a Jumping Mouse, were actual residents of the state. Among them was a fine Otter, a Wild Cat, three species of albinistic Squirrels, and one partially Albino Muskrat. The season of the year was unfortunate for procuring them in good pellage, and it was only a few days before the goods were shipped that we secured a specimen of the Varying Hare, while the Raccoon escaped us altogether; we could not collect one, and a genuine state specimen brought in to be mounted was refused us; the owner would neither loan nor sell.

In representing the birds we were obliged to be satisfied to considerable extent with skins, as again the time allowed was not sufficient to mount them. This department is represented by 338 specimens of 126 species, including one case of stuffed small specimens arranged as a wall picture, and several single specimens of the larger sort, such as Eagle, Loon, Heron, etc.

This was followed by an arrangement of the Turtles, mounted and naturally tinted, including all the varieties likely to be found in Rhode Island, except perhaps two of the marine forms. Our other reptiles and batrachians were represented by alcoholic preparations, and the paucity of species is in marked contrast with those of the Southern States.

The Crustaceans, Lobster, Horse-shoe Crab, (Limulus polyphemus) and a dozen other species, all found within the waters of the state, were carefully stuffed and painted (generally from living models) as nearly as possible to the brilliant hues of life, such as could hardly be conceived of by those who have not seen them fresh from the water.

Our exhibition of insects is not very commendable, being confined to one exhibition case containing about two hundred of the most notable or brilliant forms.

The Conchology we were able to represent by about one hundred species.

For our exhibition of fossil forms, as we do not deal in them, we are indebted to the kindness of Brown University. The collection loaned contained nearly all the carboniferous flora of the state, being particularly valuable, as the identification has been demonstrated by Professer Leo. Lesquereux, the only living authority.

In like manner while we carry a full stock of fine minerals for exhibition or study purposes, to obtain some of the fine local specimens we were obliged to draw freely upon private cabinets. To these friends we are much indebted. This part of the exhibition embraces all the species of any importance that occur, but might have been extended much further in individual and handsome specimens, if space had not been limited.

The specimens belonging to us are for sale, and we are prepared to estimate at any time for similar collections, wholly or in part, correctly labeled, and mounted on cherry or ebonized blocks, or in card-board trays.

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NEW PRICE-LIST OF EGGS

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A QUARTERLY JOURNAL OF ORNITHOLOGY.

The Auk, now entering on its second volume, while thoroughly scientific, aims at popularizing Ornithology, and its pages are open to the Field Ornithologist and Amateur as well as to the Scientist. Volume I. contained contributions from nearly sixty of the best known Ornithologists of the United States and Canada. Its present tendency is toward a less technical character than it presented in its earlier numbers, with a larger proportion of more or less popular articles. As heretofore, the Reviews of current ornithological literature, and the departments of General Notes, Correspondence, and Notes and News, will form a prominent feature of the magazine. In the department of Recent Literature notice will be given of all papers relating especially to North American Ornithology, *wherever published*, as well as also of all monographic and general works. The Auk thus covers the whole field of Ornithology in a way to make the magazine indispensable to all who desire to keep pace with the subject, and especially with the current literature of North American Ornithology. The magazine is issued quarterly, the numbers averaging about 100 pages each.

The Auk is published under the editorship of Mr. J. A. Allen, with the assistance of Dr. Elliott Coues, Mr. Robert Ridgway, Mr. William Brewster, and Mr. Montague Chamberlain.

Terms: $3 a year, including postage, strictly in advance. Single numbers, 75 cents. Free to foreign members, and to active members not in arrears for dues.

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All articles and communications intended for publication, and all books and publications for notice, should be sent to J. A. Allen, Cambridge, Mass.

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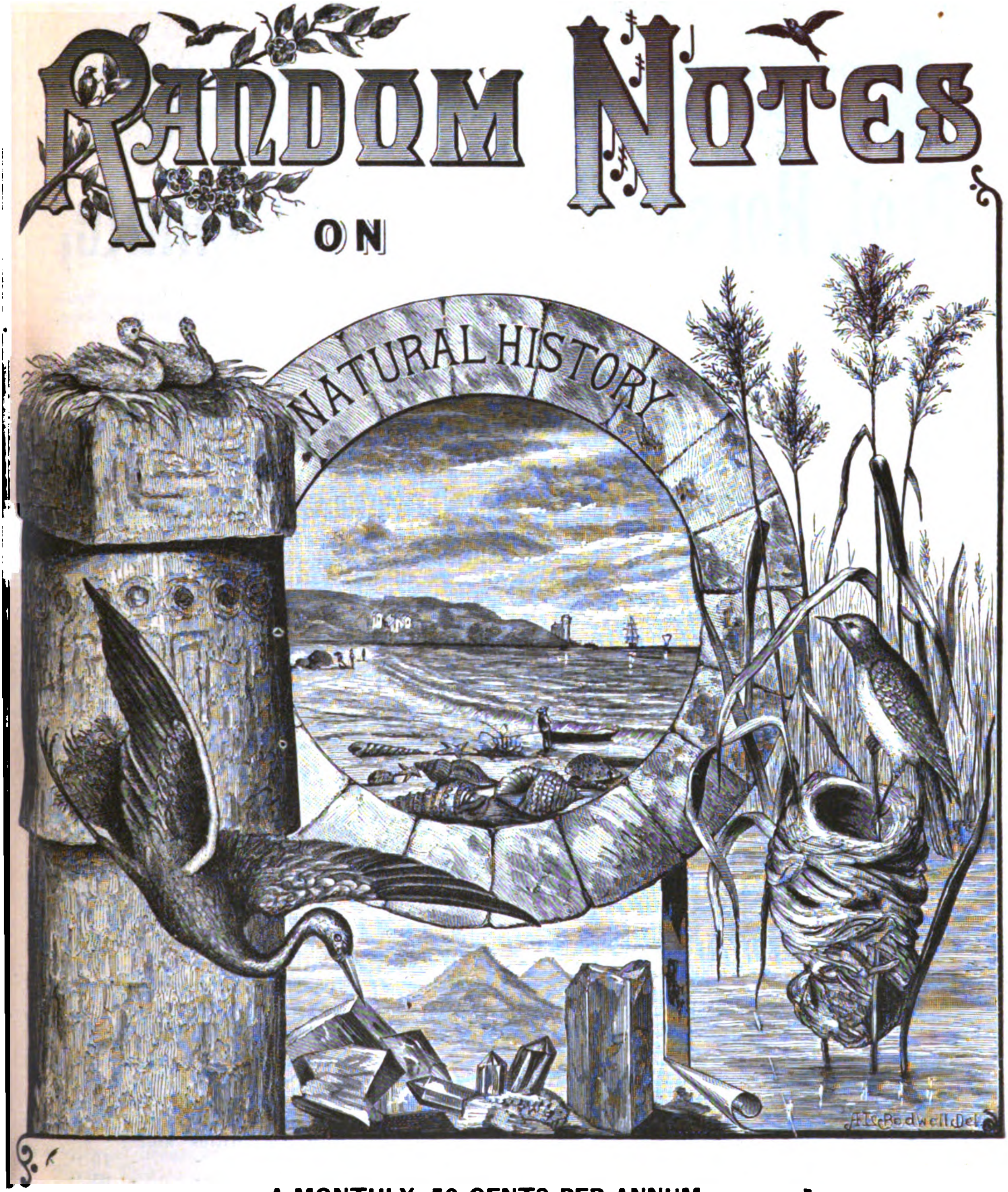

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3 x 2x¾,	" "	.12	"	.75
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(*Continued from page* 39.)

coast of Maine, and perhaps before many years will find its way into our bay, and become one of our staple articles of food." In 1880 I noticed it at Newport, and in 1882 at Nayatt Light-house, and last summer it was found everywhere in our bay. It is abundant enough with us now to feed the entire population of the state, and no doubt, when its virtues become known, will prove a very valuable and popular edible. I throw out a hint to owners of oyster-beds, if they are troubled with an excess of sea-weed, to gather quantities of these shells and scatter them over the beds, (as they live upon sea-weed and will do the oysters no harm. The shell is variable, but is always quite solid, a little glossy, about one inch or more in length, sometimes an inch in breadth, generally black or brown in color, with six or seven whorls, apex acute, and suture simple, fine and well marked. Gould's *Invertebrata of Mass.* has a page and a half of description of this species.

(*To be continued.*)

RANDOM NOTES for January, 1885, contained a list of rare eggs and skins from Arizona; February, a long list of skins and eggs wanted, and of what we have for exchange; and April, a price-list of mammals and turtles, and a supplement to our new price-list of eggs. Any of the above numbers, 6 cents each.

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Beaver	
Black Bear	30.00 to 50.00
Bear (grizzly)	75.00
Cat (wild)	7.00 to 10.00
Deer, Virginia	60.00 to 75.00
" head with shield	10.00 to 12.00
Elk head with shield	20.00 to 30.00
Fox	8.00 to 10.00
Frogs	1.25
Lynx	12.00
Mink	4.00 to 5.00
Mole, Mice	1.25
Musk Rat	2.00
Otter	10.00
Panther	50.00
Rabbit (common gray)	3.50
" (jack)	5.00
" varying Hare	4.00
Raccoon	8.00 to 10.00
Seals	6.00 to 12.00
Squirrels, ground	1.50
" red	1.75
" gray	2.00
" fox	2.00
Skunk	4.00 to 6.00
Turtles	1.75 to 5.00
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6	05	45	02	10	30
7	06	50	02	12	35
8	07	60	02	14	40
9	08	70	03	16	50
10	09	80	03	18	70
11	10	90	04	20	80
12	12	1 00	04	22	1 05
13	14	1 20	04	25	1 20
14	17	1 50	05	35	1 40
15	19	1 70	06	45	1 60
16	20	1 90	07	50	1 90
17	23	2 10	08	60	
18	26	2 30	09	70	
19	28	2 50	11	85	
20	32	3 00	14	1 10	
21	40	3 50	18	1 20	
22	50	4 50	20	1 50	
23	60	5 25	22	1 75	
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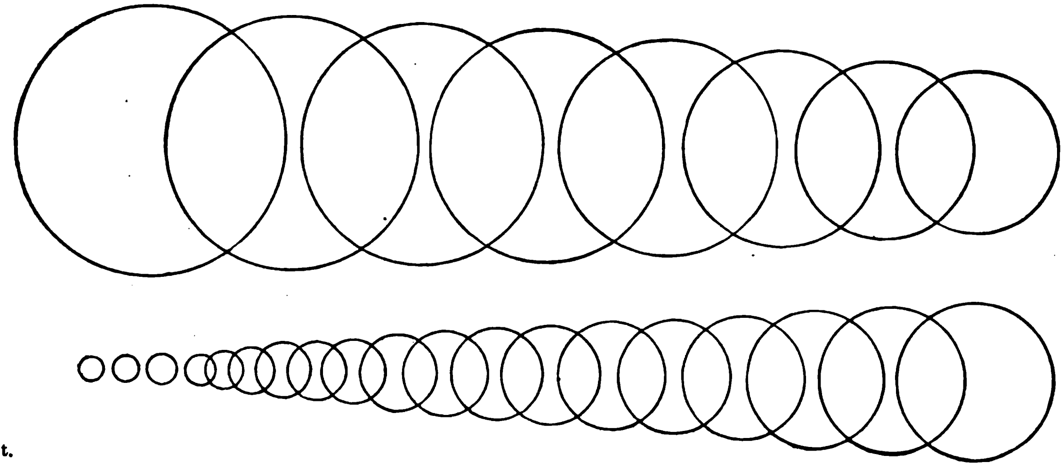

No.	Diameter.
1	1 .3-32 in.
2	4 "
3	5 "
4	6 "
5	7 "
6	8 "
7	9 "
8	10 "
9	11 "
10	13 "
11	14 "
12	15 "
13	16 "
14	17 "
15	18 "
16	20 "
17	22 "
18	24 "
19	26 "

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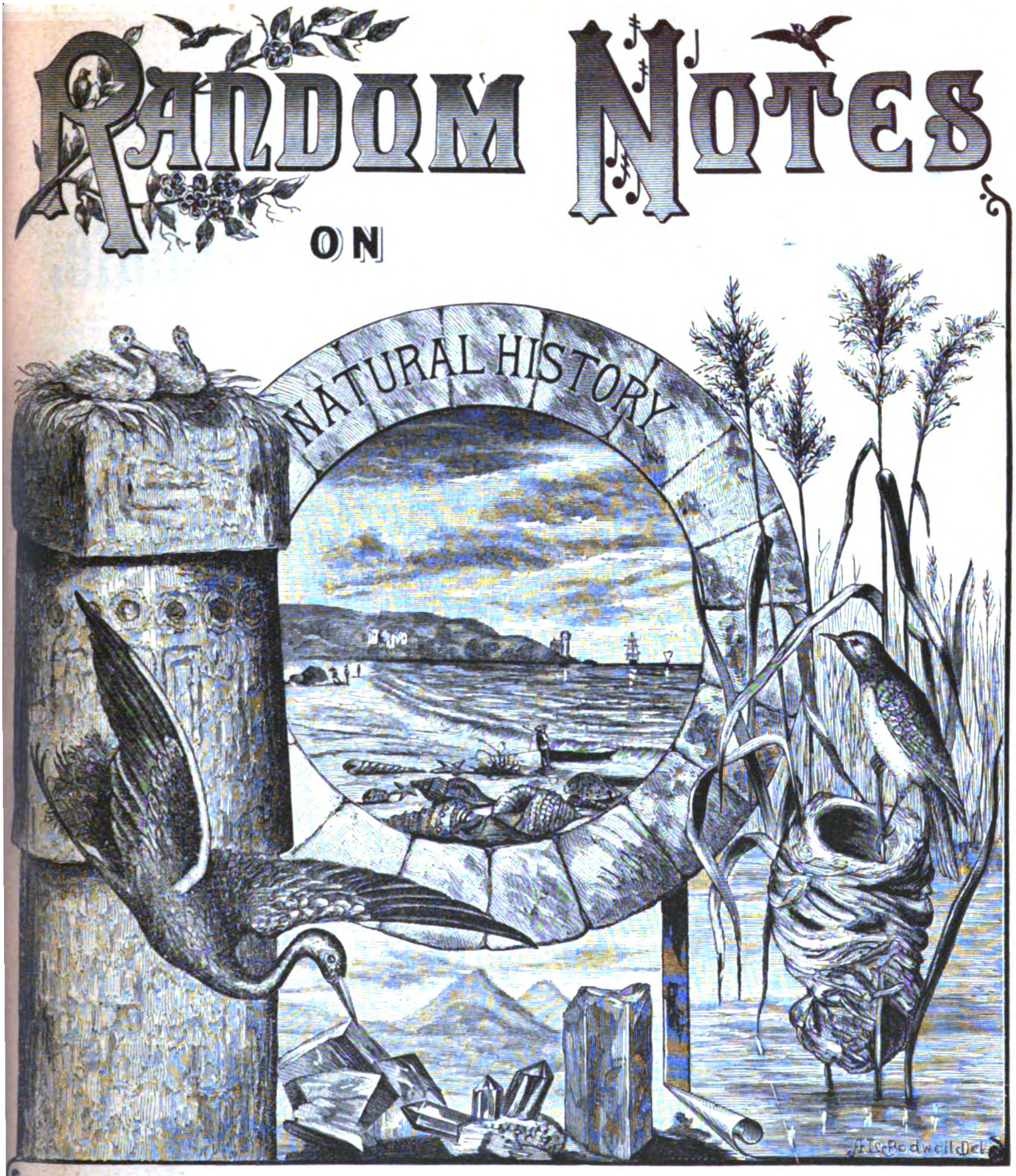
VOL. II. NO. VI.

RANDOM NOTES ON NATURAL HISTORY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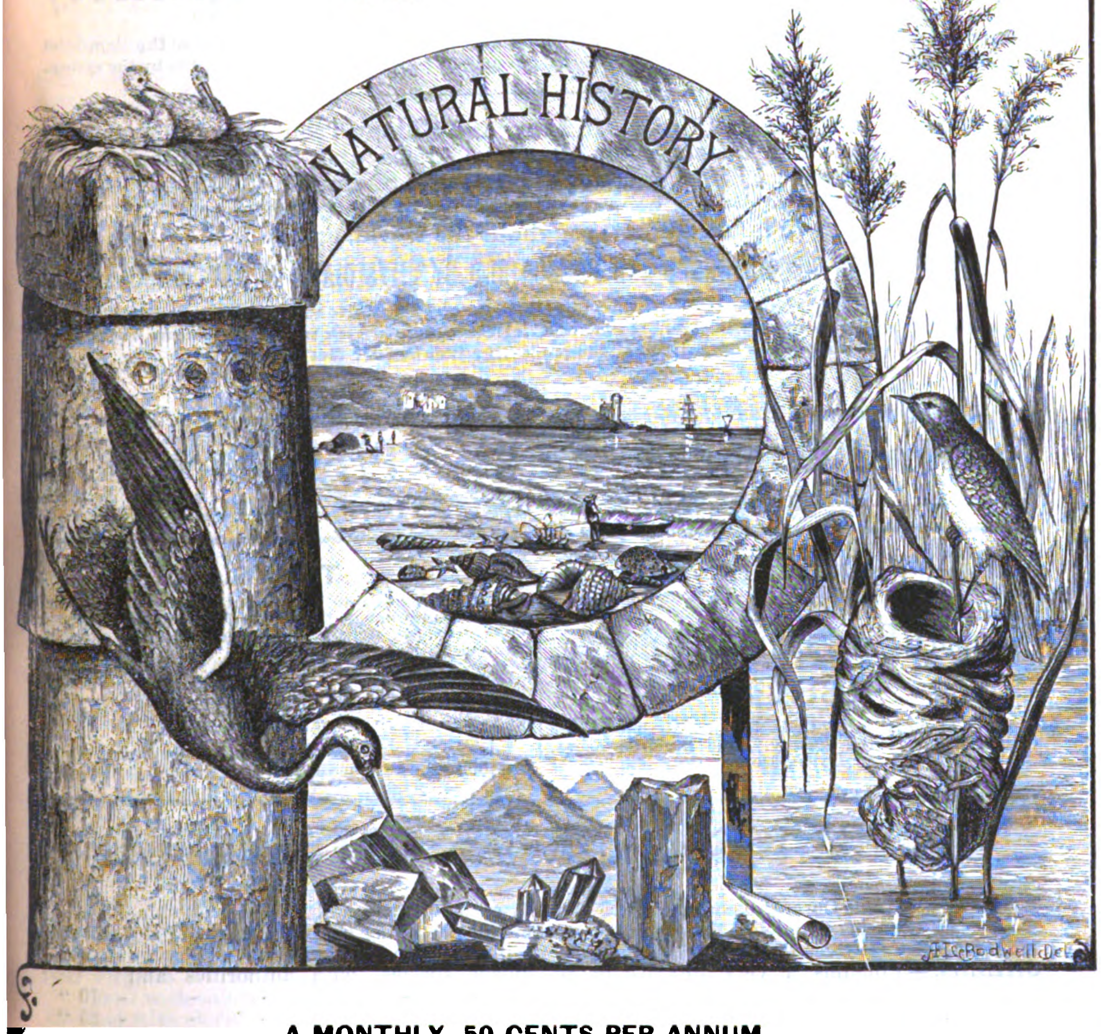
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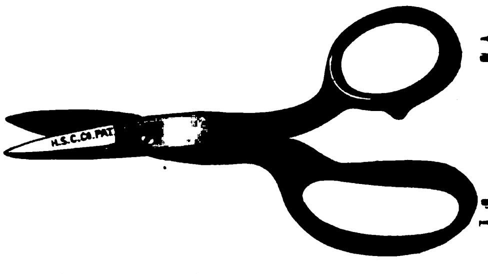

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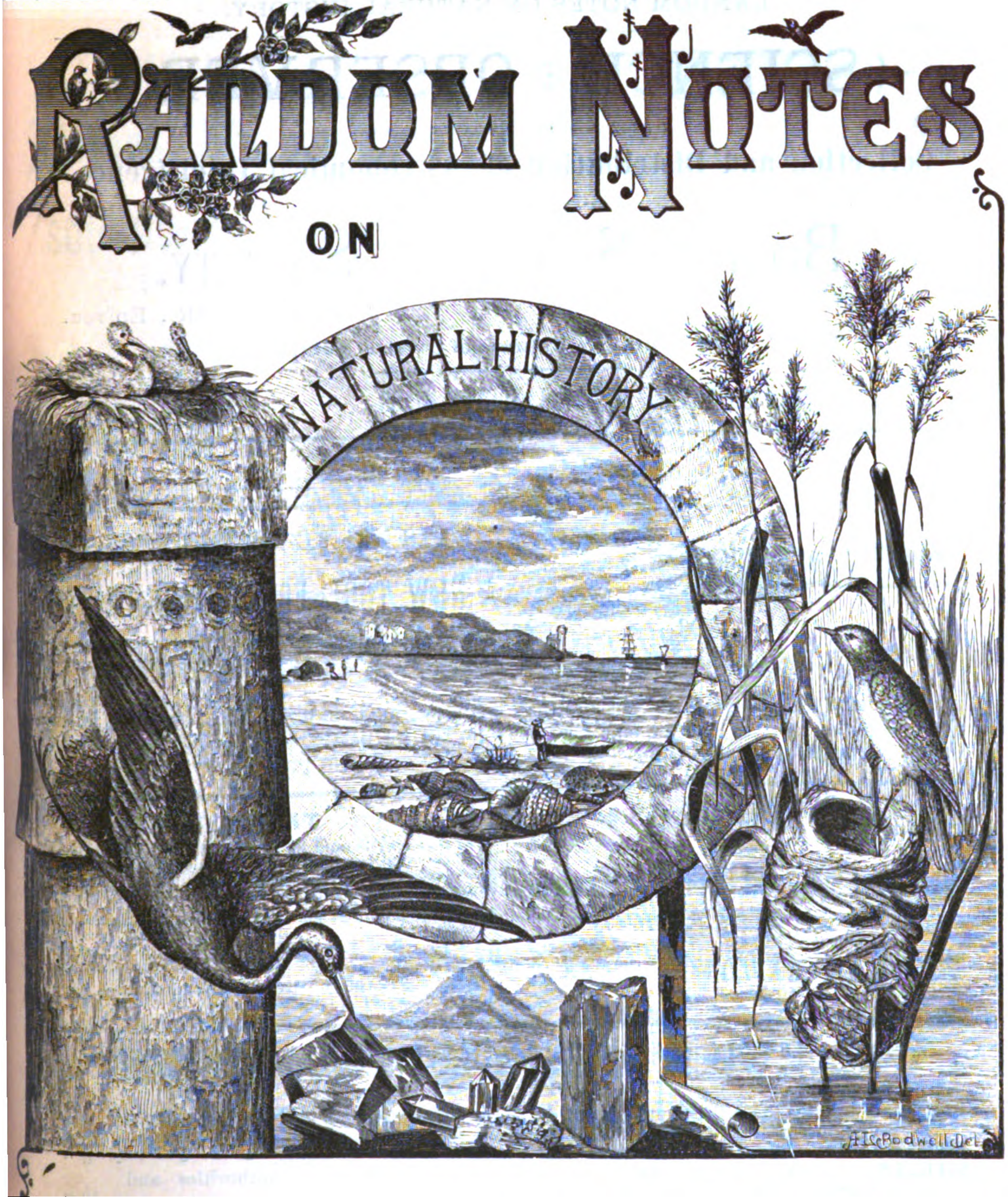
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8	07	60	02	14	40
9	08	70	03	16	50
10	09	80	03	18	70
11	10	90	04	20	80
12	12	1 00	04	22	1 05
13	14	1 20	04	25	1 20
14	17	1 50	05	35	1 40
15	19	1 70	06	45	1 60
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18	26	2 30	09	70	
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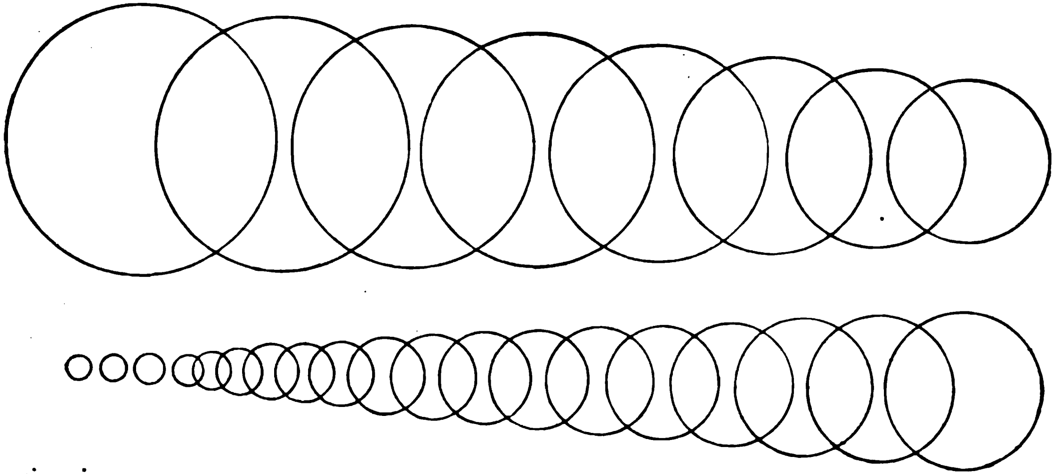

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14	17 "
15	18 "
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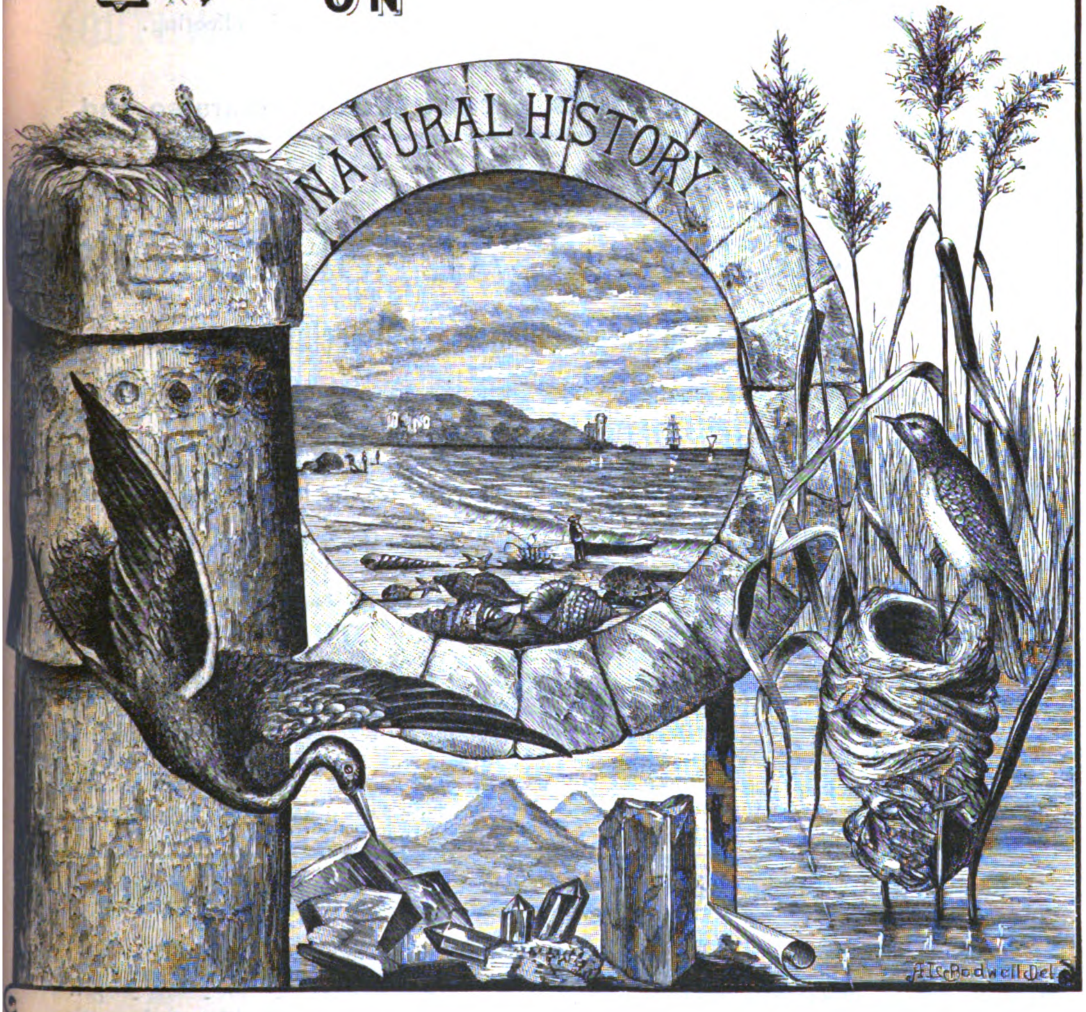
RANDOM NOTES

ON



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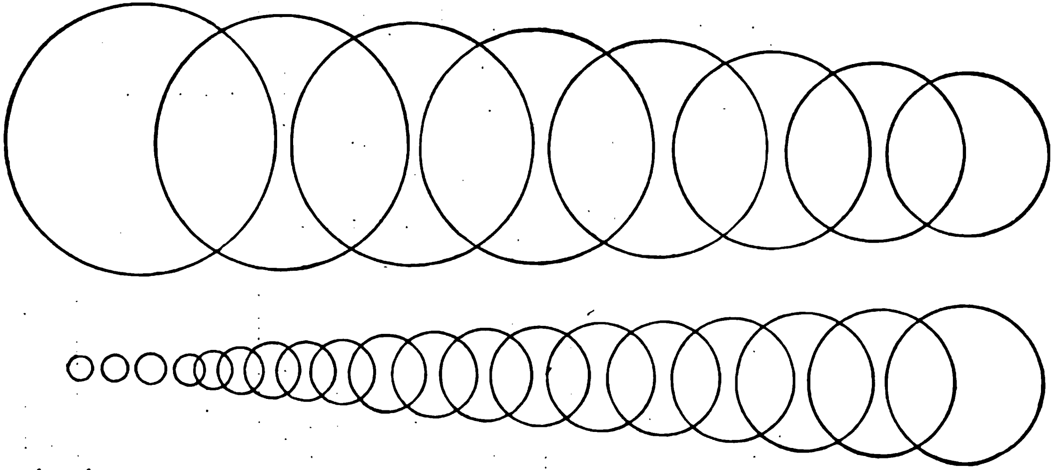

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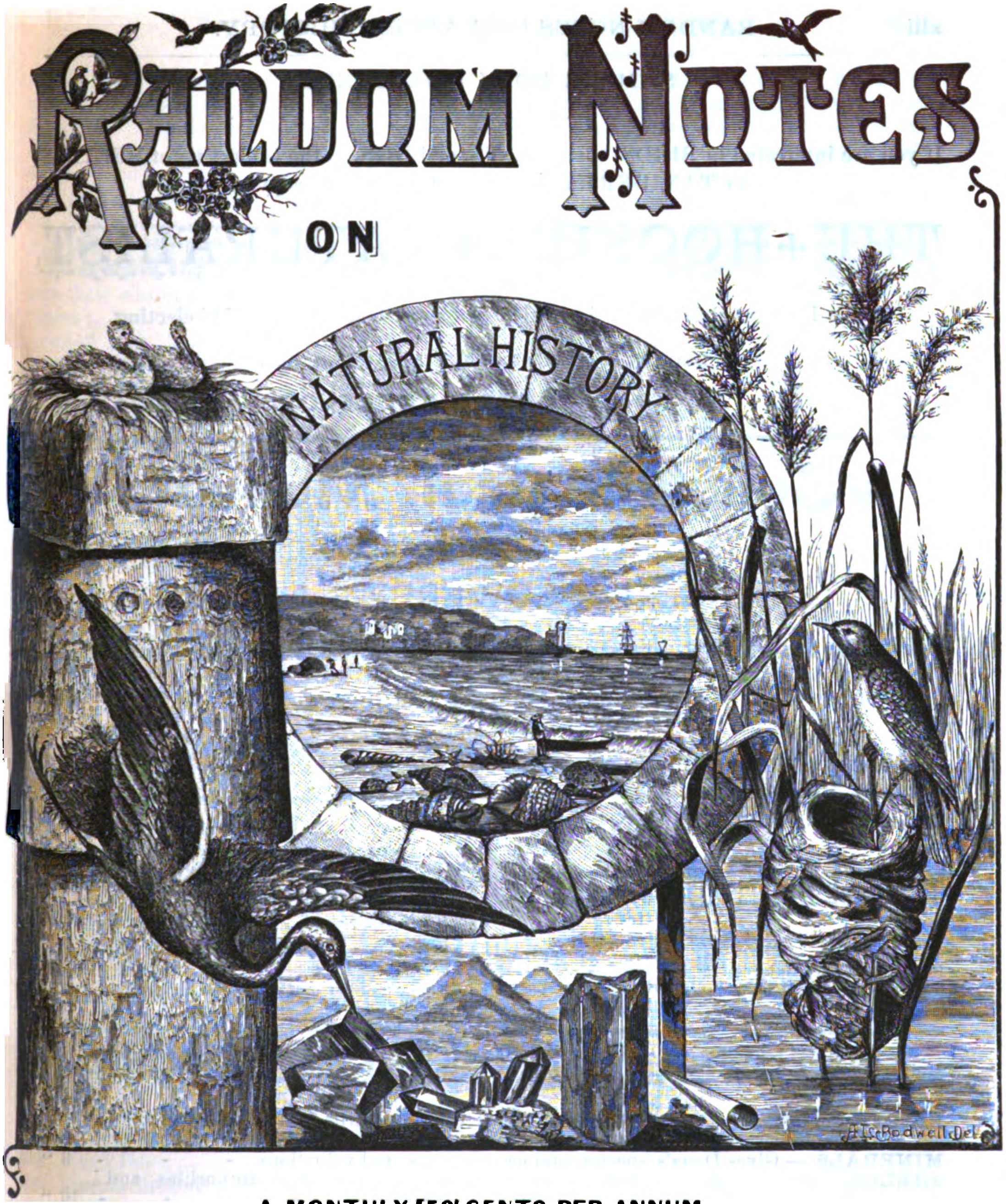

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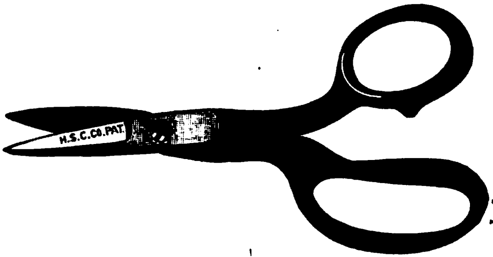

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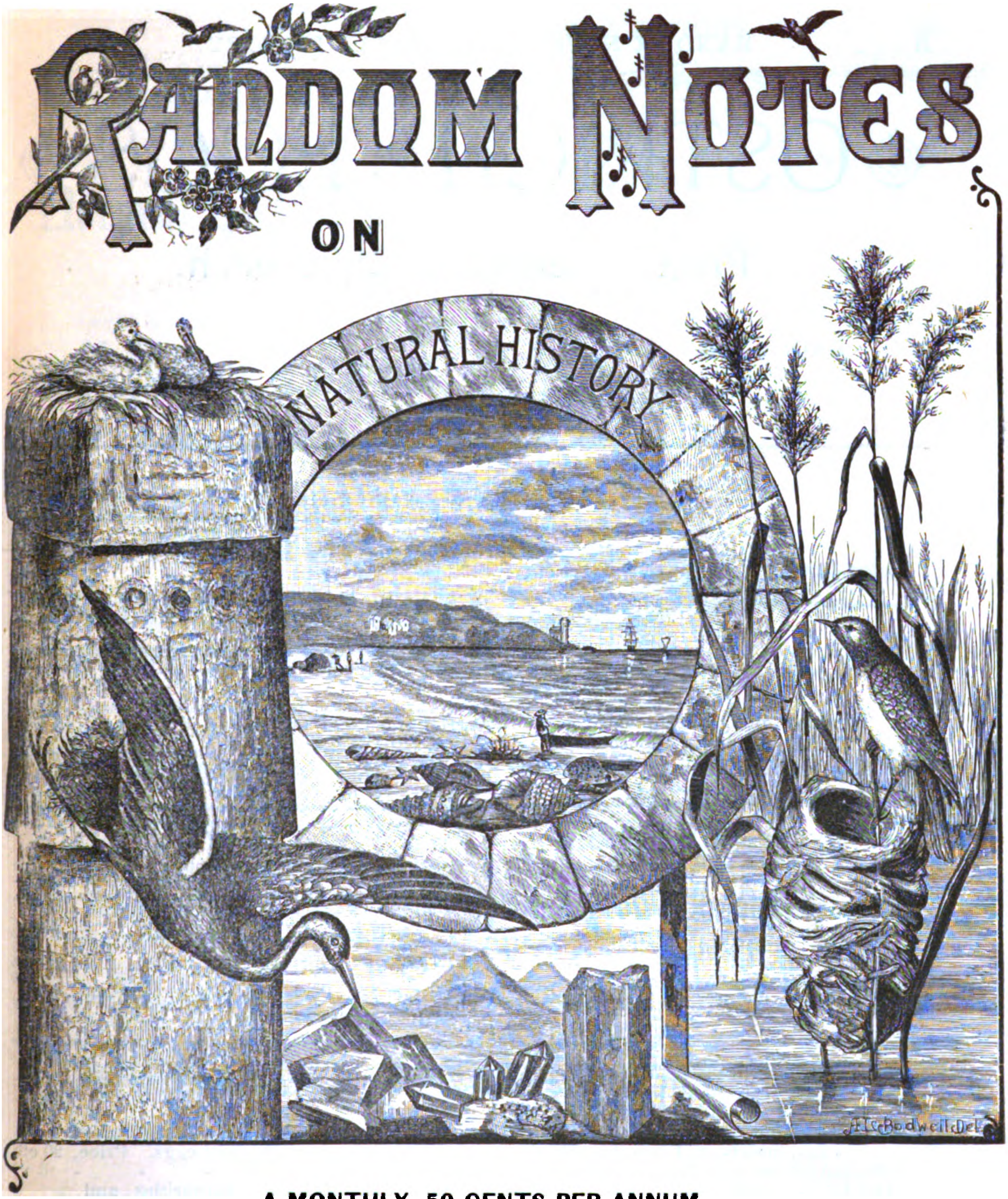
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Cerithium septemstriatum, Hayti	10 for	10
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" atratum, Brug., Hayti		5
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Chondropoma biforme, Pfr., Gonave Islands	10 for	10
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" undata, Lam., Mauritius	10 to	25
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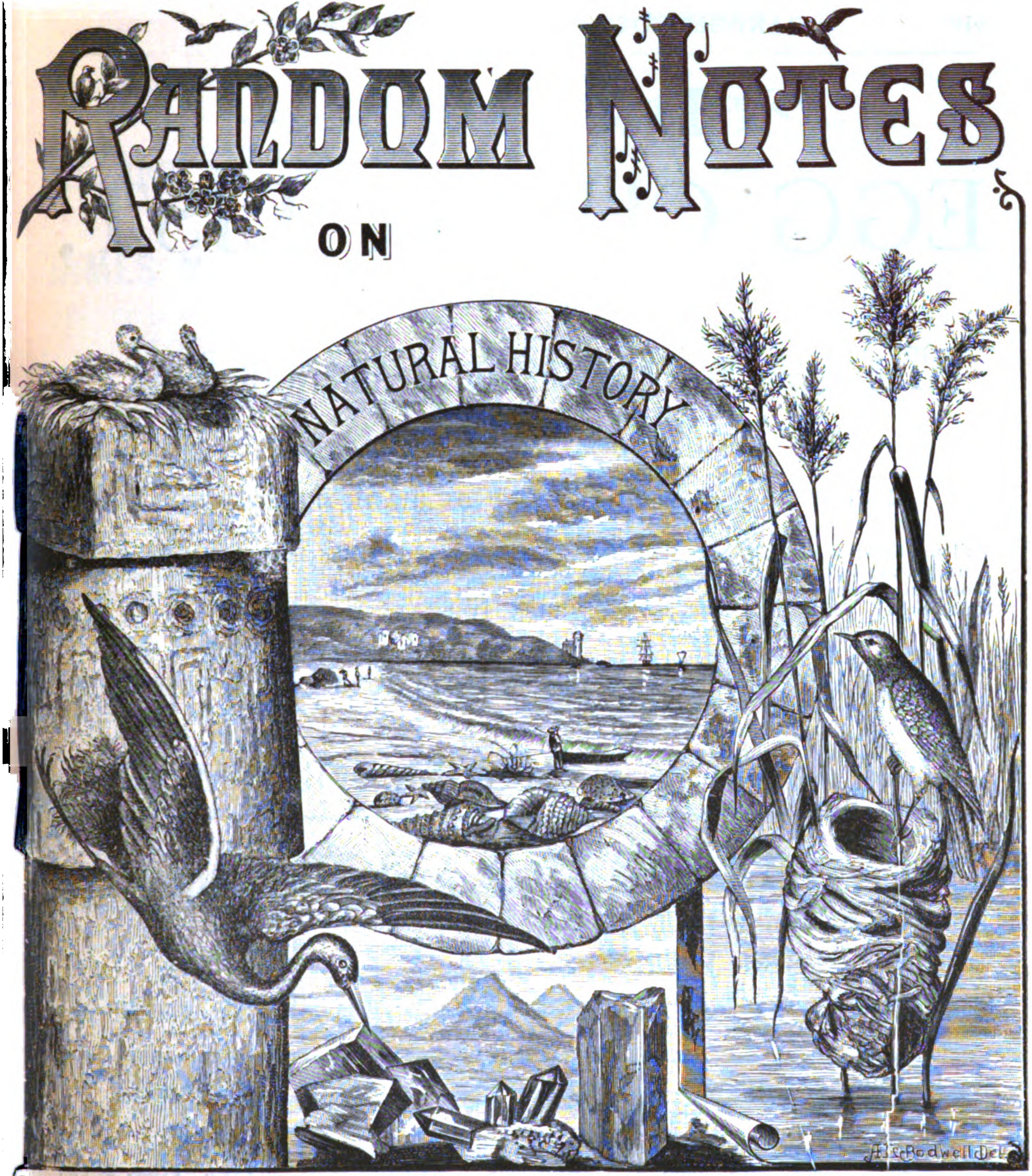

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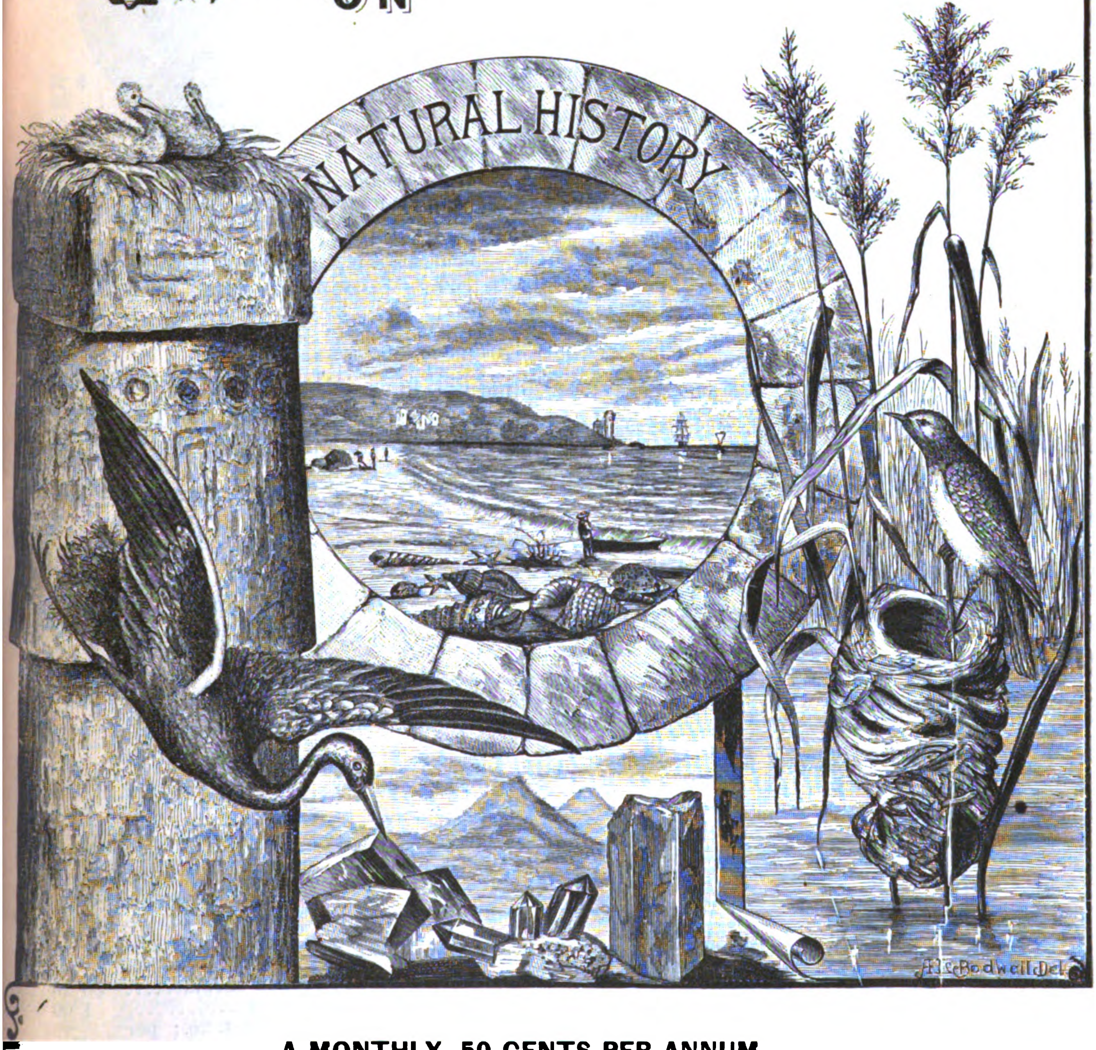

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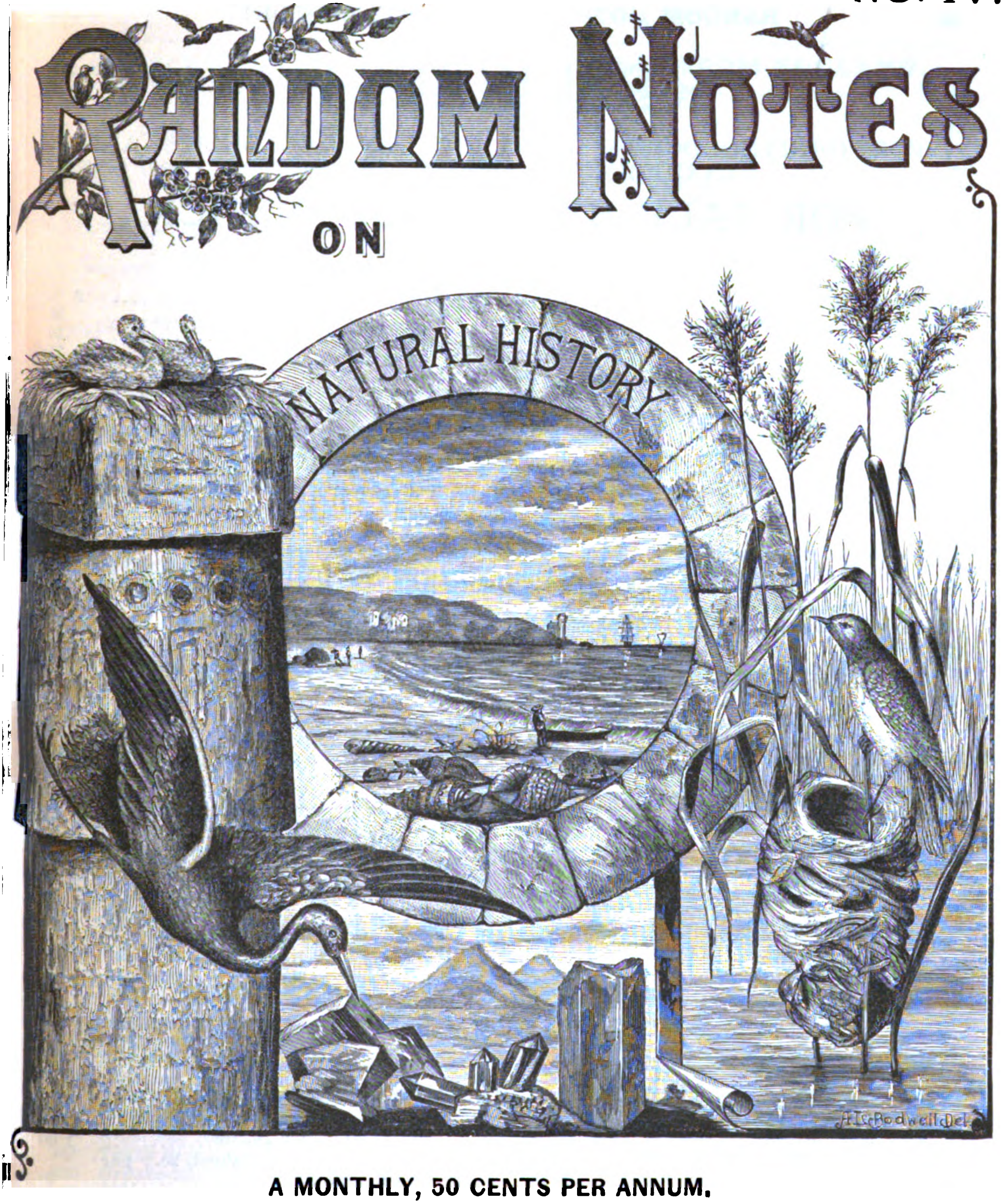

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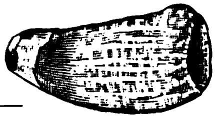

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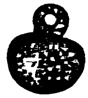

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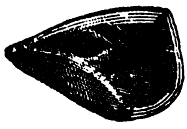

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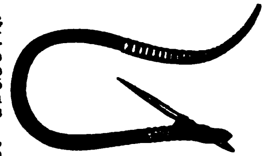

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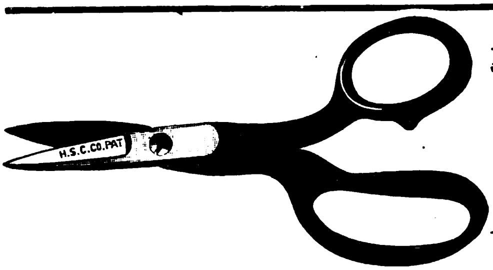

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VOL. III. NO. VI.

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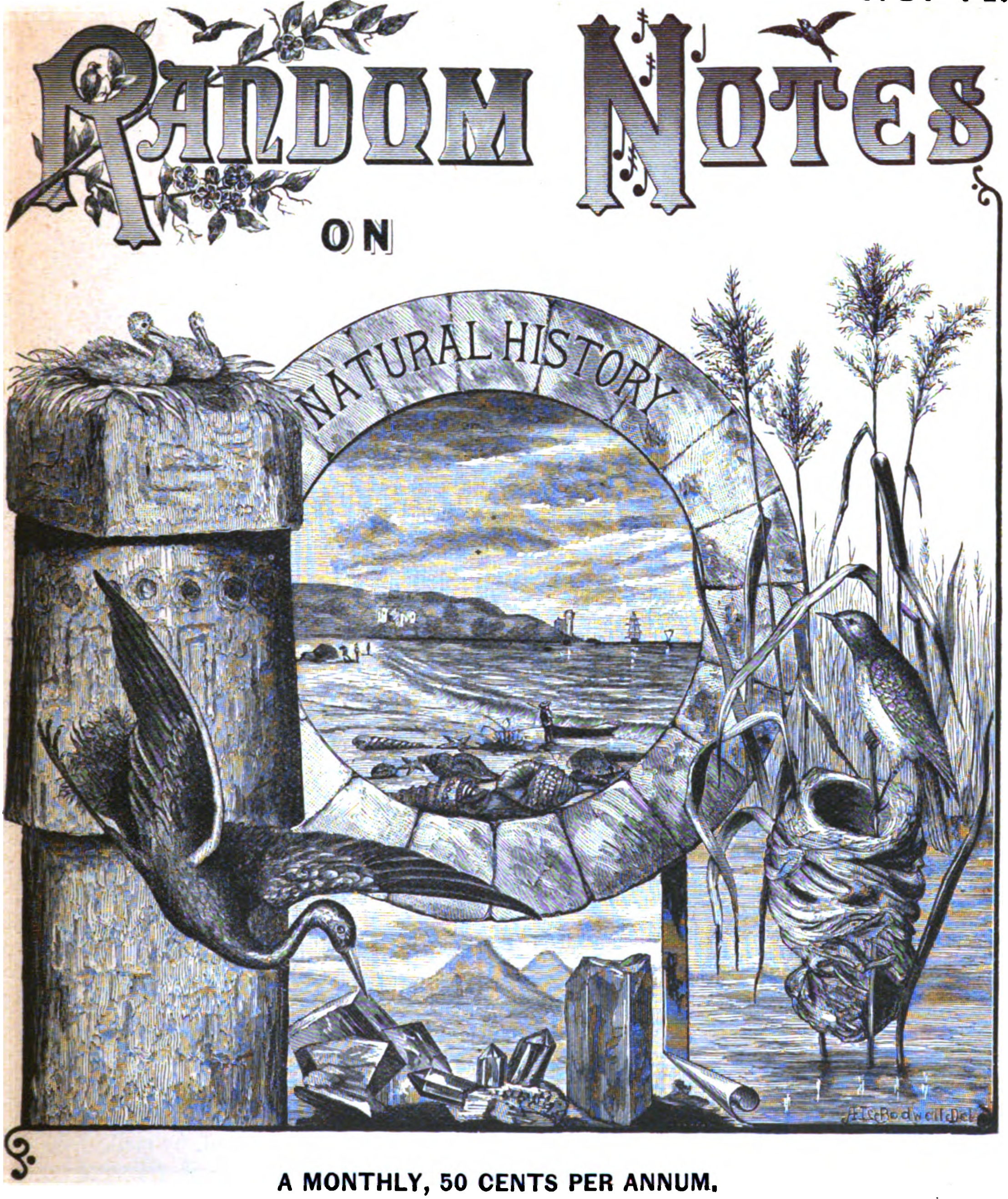
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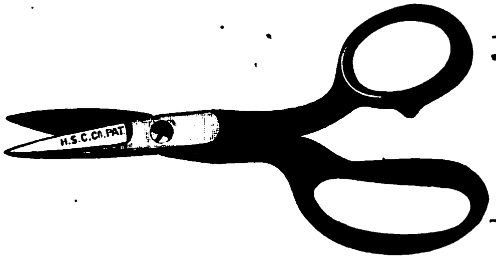

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16.	*nivosa Lam.,*	1 Small.	.50
18.	*rückerii Cross.,*	1.	2.50
25.	*rupestris Gmel.,*	2.	.50
26.	*pacifica Sal.,*	1.	$1.50
27.	*deshayseii Reeve,*	1.	1.50
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35.	*hebræa Linn.,*	1.	2.00
45.	*angulata Sw.,*	1.	3.00
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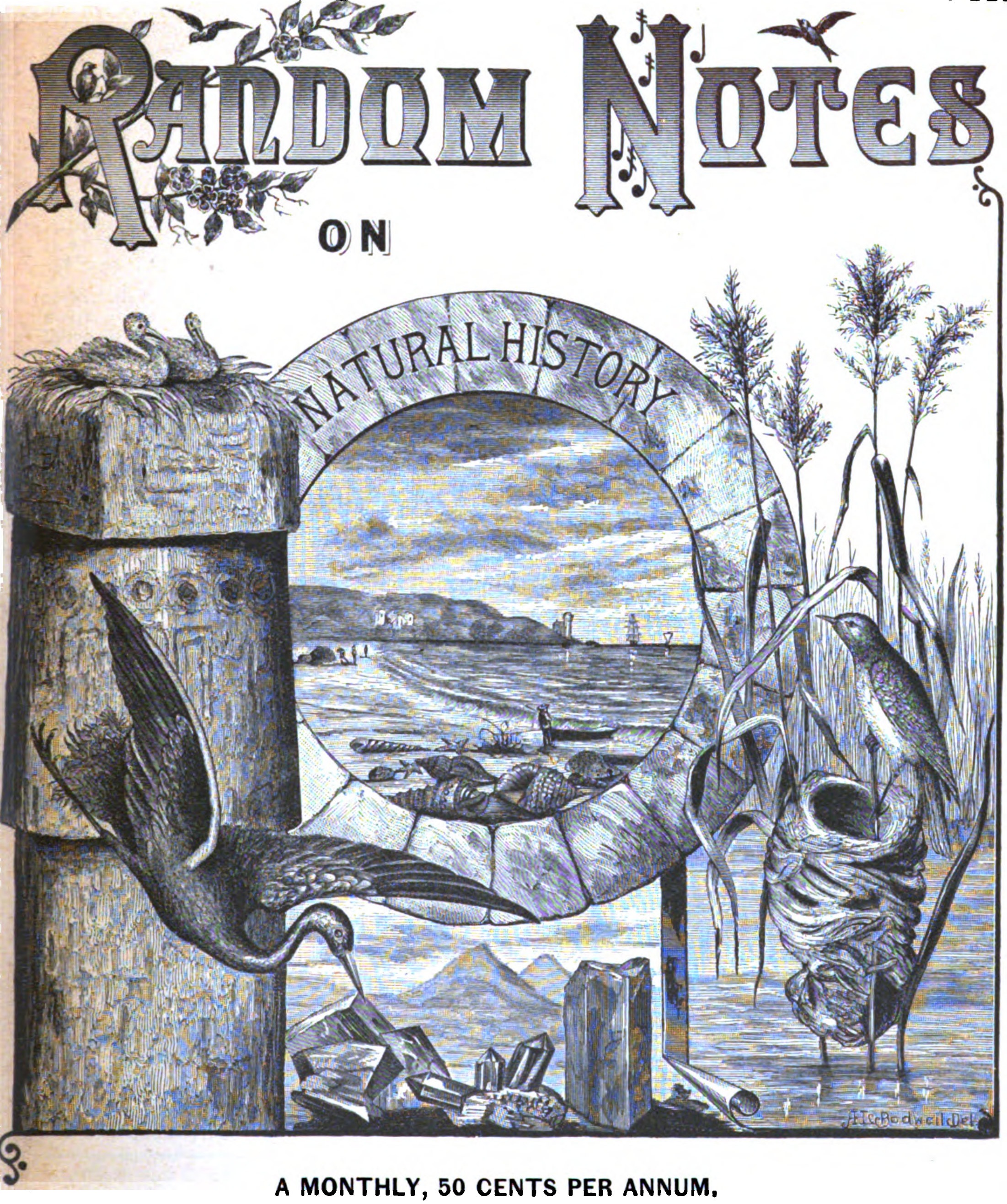

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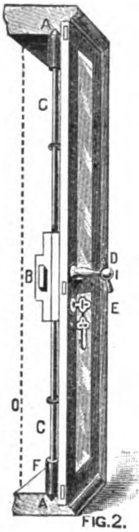
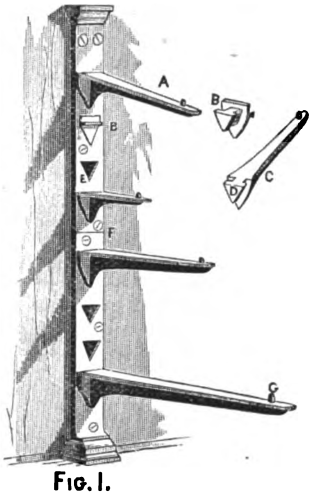


FIG.2.



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2	.03	.30	.04	.35	....	....	....	....	.01	.05	.14	2
3	.04	.35	.05	.40	....	....	....	....	.01	.05	.16	3
4	.04	.35	.05	.45	....	....	....	....	.01	.08	.20	4
5	.05	.40	.06	.45	....	....	....	....	.02	.08	.25	5
6	.05	.45	.06	.50	.10	....	....	....	.02	.10	.30	6
7	.06	.50	.07	.60	.10	....	....	....	.02	.12	.35	7
8	.07	.60	.08	.70	.12	....	....	....	.02	.14	.40	8
9	.08	.70	.09	.80	.12	....	....	....	.03	.16	.50	9
10	.09	.80	.11	1.00	.15	1.40	.16	1 50	.03	.18	.70	10
11	.11	1.00	.13	1.20	.16	1.50	.18	1.70	.04	.20	80	11
12	.12	1.10	.14	1.30	.18	1.60	.20	1.80	.04	.22	1.10	12
13	.14	1.30	.17	1.50	.22	2.00	.25	2 40	.04	.25	1.20	13
14	.16	1.50	.22	2.00	.24	2.20	.27	2.60	.05	.35	1.40	14
15	.18	1.70	.24	2.20	.26	2.50	.30	2.80	.06	.45	1.60	15
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17	.23	2.20	.30	2.80	.32	3.00	.36	3.50	.08	.60	2.00	17
18	.26	2.50	.32	3.00	.36	3 40	.42	4.00	.09	.70	....	18
19	.32	3.00	.36	3.50	.40	3 80	.46	4 50	.11	.85	....	19
20	.36	3.50	.40	3.80	.46	4.50	.58	5.50	.14	1.10	....	20
21	.40	3.80	.46	4.50	.50	4.80	.64	6.00	.18	1 20	....	21
22	.50	4.80	.60	5.40	.70	6.50	.80	7 50	.20	1 50	....	22
23	.60	5.30	.72	6.30	.80	7.40	.90	8.50	.22	1.75	....	23
24	.65	6 30	.84	7.50	.95	8.70	1.10	10.00	.24	2.00	....	24
25	.75	7.00	.90	8.40	1.00	9.80	1.20	11.00	.28	2 50	....	25
26	.90	8.50	.95	10.00	1.20	11.50	1 30	12 50	.34	3.00	....	26
27	1.00	9 50	1.20	11.00	1.30	12 50	1.40	13.00	.40	3.50	....	27

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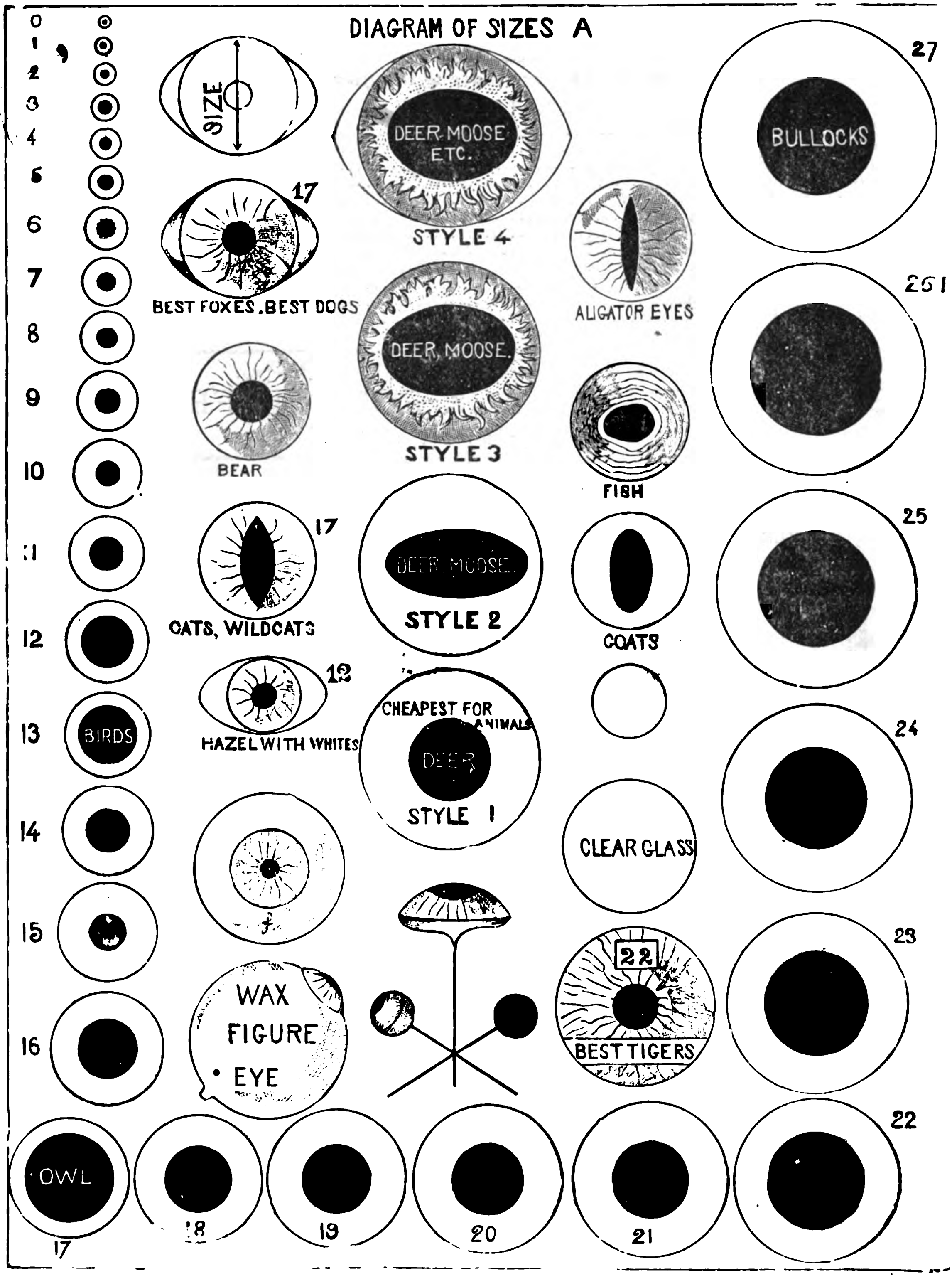

DIAGRAM OF SIZES A